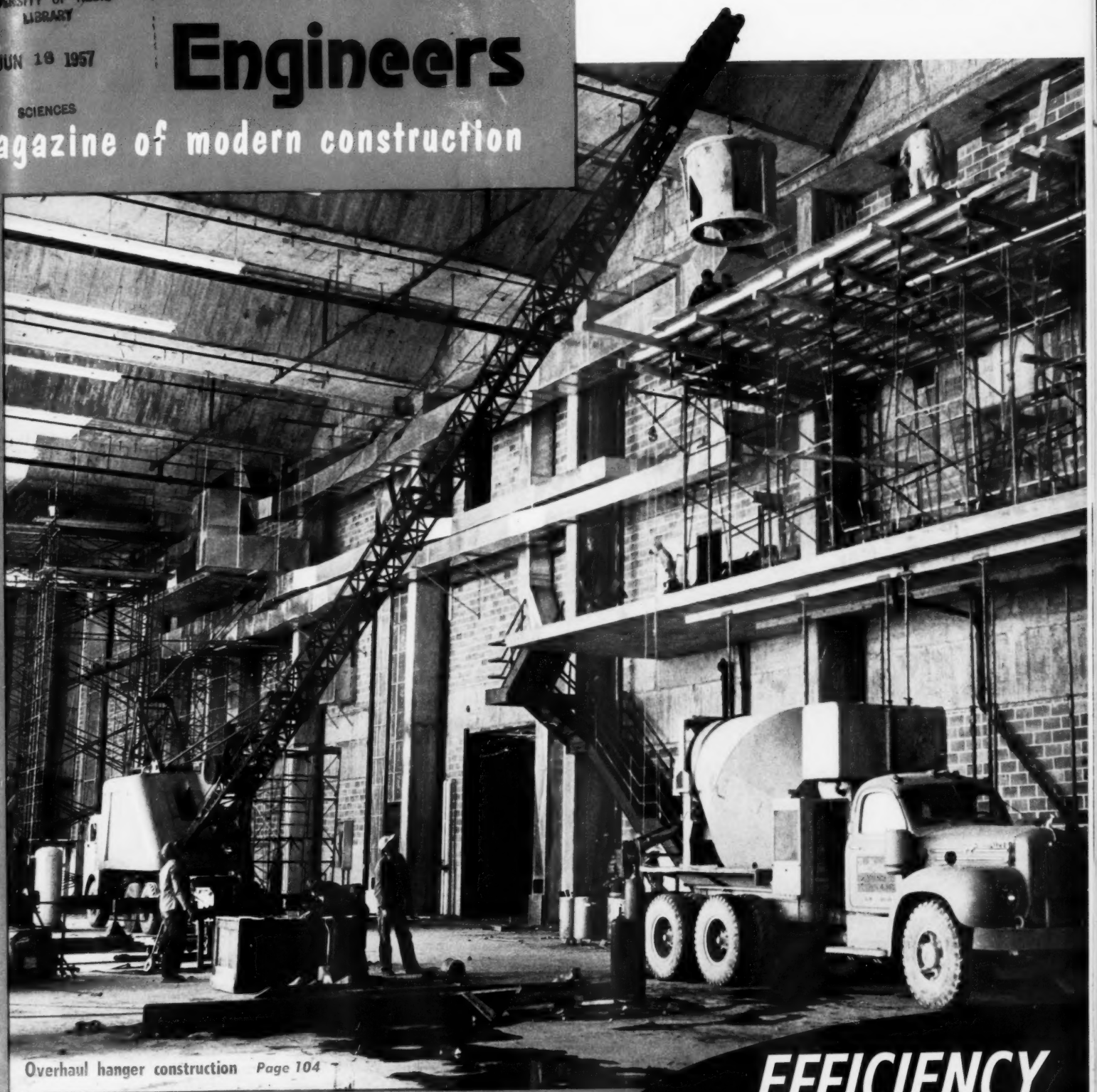


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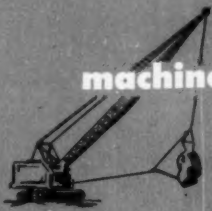
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Overhaul hanger construction Page 104

**EFFICIENCY
and ECONOMY**
Special Issue

machinery



materials



methods



maintenance



men

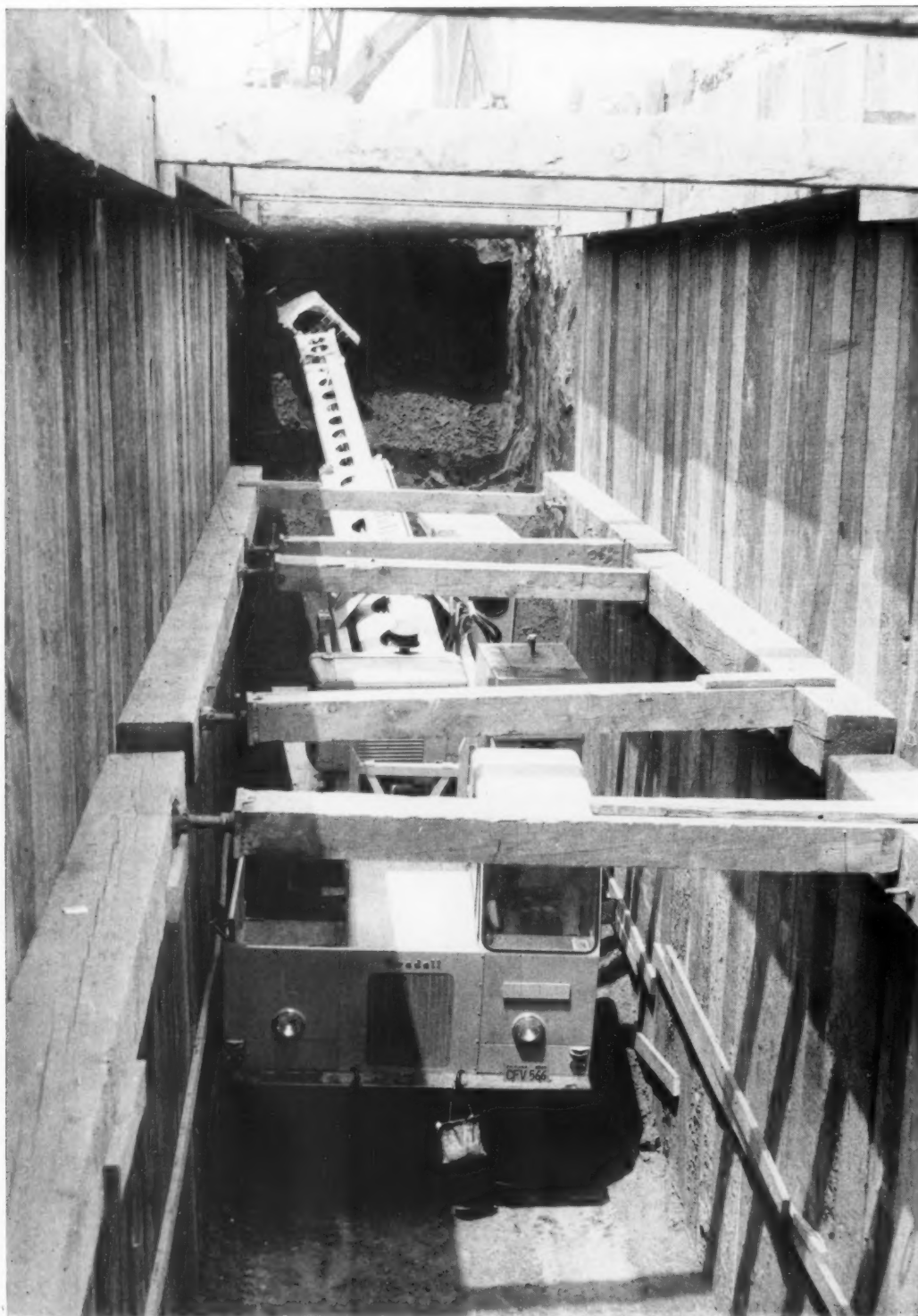


management



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says A. Teichert & Son, Inc., Sacramento, Calif.



A. Teichert & Son, Inc., Sacramento, uses Gradall to speed work on the building of a reinforced concrete box storm drain for the Los Angeles Flood Control District.

WORKING on the bottom of this narrow 26-foot deep trench, a single Gradall speedily, safely and economically loosens muck from around existing utility lines—without any damage to these vital pathways.

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Contractors and Engineers

CONTENTS

JUNE 1957

magazine of modern construction

MACHINERY

- 6 Dragline and conveyor feed aggregate to concrete plant
- 10 Three hot-mix plants supply three jobs from one quarry
- 16 Slip-form paver combines work of finishing equipment
- 22 Travel plant speeds cement-aggregate road base
- 26 Steel handling rigs team up for bridge erection
- 30 Shovels, draglines, trucks get big yardage for dam
- 38 Pile drivers challenge open sea to build piers
- 40 Coming up: machine-laid asphalt curbs and gutters
- 50 The tractor shovel comes of age



Machinery speeds batching operations at dam. Page 6

MATERIALS

- 62 Tape wrapping on pipeline saves labor, equipment
- 68 New materials cut cost, time on 34-acre plant roof
- 72 Two-man teams save money on all-bolted building
- 74 First use of tetrapods in U. S. on breakwater



Materials cut size of wrapping crew. Page 62

METHODS

- 80 Contractor beats steel shortage by prestressing units
- 90 How to get water is big problem on earth-fill dam
- 96 Blast patterns in roadbuilding
- 104 Firm improves way of building cable-suspended roof
- 116 Hoisting rig provides new technique for lifting beams

MAINTENANCE

- 166 Daily, weekly, monthly checks keep equipment working
- 172 Dealer's service rigs tackle any job in the field
- 175 Care of parts lengthens life of electric tools
- 182 Road sign repairs expected to reach \$200 million



Maintenance on earthmoving fleet. Page 166

MEN

- 188 Crews supply muscle for carving out big sewer
- 193 County program helps relieve engineer shortage

MANAGEMENT

- 196 Forming service—a short cut for contractors
- 200 Construction progress photos have many uses
- 204 Cost records point out savings for materials producer
- 206 The Engineering Department: Carpentry, specialties

DEPARTMENTS

- 77 Avoid Legal Pitfalls
- 208 Construction Camera
- 9 Convention Calendar
- 4 Editorial
- 60 Labor Review
- 58 Manufacturer Memos
- 88 Names in the News
- 183 Product Literature
- 121 Product Parade
- 214 Surveying Washington
- 202 The Lighter Side



Men carve out relief sewer. Page 188

Information and public relations

Construction throughout the country is climbing to a peak this time of the year, and such activity generally continues at top level through the next four or five months. During this period the public too is on the move, on trips or vacations, getting out into the open where they can see what the builders are doing on various projects. If this amorphous public is tax-conscious, as the public opinion polls indicate, a healthy curiosity is aroused as to what the tax dollar is bringing in the form of public works and improvements. Here is where a thought to public relations on the part of government agencies and contractors is in order.

Private owners, as a rule, do not have to be told about public relations. When a bank, store, office, or apartment building is going up, the contractor usually provides peep holes or slots in the enclosing fence so that the public "sidewalk superintendents" can watch construction progress. The owner or his representative generally erects a large sign telling what is going on, who is responsible for the improvement, when the structure will be ready for occupancy, and the name of the renting agent if tenants are solicited. Federal agencies, such as the U. S. Army Corps of Engineers and others, wisely maintain observation posts with maps and diagrams explaining the work during the construction of their larger projects. Such vantage points are well patronized by the public. Visitors to the St. Lawrence Seaway and



Power Project are afforded the opportunity to view and understand the various phases of this great river improvement.

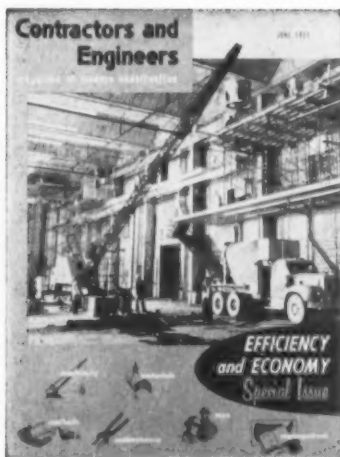
One area where relations with the public could be improved is highway construction. Here is where the relationship between the tax dollar (from gas, oil, tires, excise, etc.) and the new road is most clearly defined. Some states post informative signs at highway projects, but too many do not. If this were done adequately, the motorist would realize what he is getting for his tax payments. Such posted information would be especially effective at detours, or where one-way traffic must be maintained. Portable signs that could be shifted about readily to desired locations may be needed.

The highway contractor can be most helpful on such projects. This applies not only to the head of the firm or his superintendent but to all his crew, for they will be in constant contact either with the motoring public or with residents along the highway. Courteous answers, supplying correct information to queries of the public, will do much to mold public opinion to full cooperation with the road program. Curt and brusque replies—or none at

all—will only alienate the tax payer who is, after all, supplying the revenue for such projects.

On this score of supplying information, we are again presenting this month our annual Efficiency and Economy special issue covering the six big M's of construction—machinery, materials, methods, maintenance, men, and management. We expect this June issue will be of special benefit to our readers in saving them time and money. In addition to the wide variety of illustrated and detailed job articles, we are publishing over 50 case histories that show specifically how a savings in time or money was made in some particular construction or maintenance operation.

Also, to make it easy for our readers to see what is new in construction products, we are now grouping new product information in one section of the magazine. This monthly Product Parade of equipment and material starts on page 121. Literature and catalog items are also grouped in a department starting on page 183. As before, the Request Card is bound in at page 18 for convenience in requesting free product information and literature.



During work on the unique airframe overhaul structure at the Midcontinent International Airport in Kansas City, Mo., a Byers truck-crane with 60-foot boom lifts a Gar-Bro bucket of concrete to forms for a balcony on the central portion of the hangar. The Mack B-42 uses a Smith 6-yard mixer to make the delivery.

Page 104

CONTRACTORS AND ENGINEERS

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JUNE, 1957

Efficient equipment offsetting high labor costs

Equipment manufacturers are helping contractors lick their toughest cost problem: the rising price of labor.

While inflationary pressures and increased demand for labor's services have driven wages relentlessly upward, equipment manufacturers have been designing and producing the corrective in the form of bigger, yet more efficient, equipment.

Between the years 1944 and 1955 average bid prices for federal-aid highway work increased about 35 per cent. It has been calculated that had there been no reduction during that time in the amount of labor needed to do a given amount of construction work, bid prices would have gone up 61 per cent.

The number of man hours that it takes to do a million dollars' worth of highway construction (in constant dollars) has steadily declined since World War II and appears to be continuing downward. The latest data (1955) shows that a contractor now needs to hire 43 per cent less labor than he did a little over a decade ago to accomplish the same amount of work. It seems likely that by 1970—before the current federal-aid road program is completed—there will be another drop of some 35 per cent, with 15 per cent of this drop to occur by 1960.

This is the trend indicated by a study of the available labor usage data which was reported recently by Edwin J. Coppage, Jr., Chief of the Bureau of Public Roads' Construction Management Section and Edwin L. Stern, Supervising Highway Engineer. The raw material of this study was records of man hours of labor and construction costs incurred on federal-aid highway work completed since 1944.

Plotted on a graph for every year through 1955, this labor-usage figure makes a falling curve, giving a clear picture of how increased productivity has offset rising labor costs. Reporting on this trend in *Public Roads*, the Bureau's official publication, Mr. Coppage commented: "The decrease in man-hour usage is basically due to increased productivity of the labor-equipment combination resulting from great strides that have been made by manufacturers in developing more efficient construction equipment."

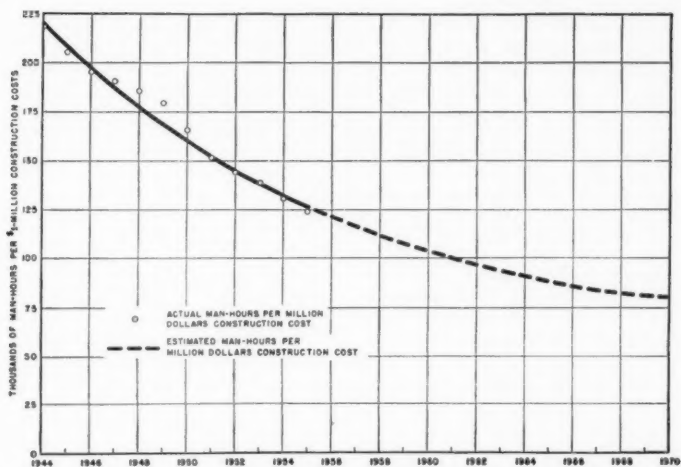
Increases in productivity in the coming years depends on the interplay of several factors.

The supply of both labor and equipment are two of these factors. If labor gets more scarce and equipment more plentiful, contractors will be even more receptive to new equipment ideas than in the past. Shortages in equipment would, of course,

stunt this healthy trend, especially if the labor supply improves.

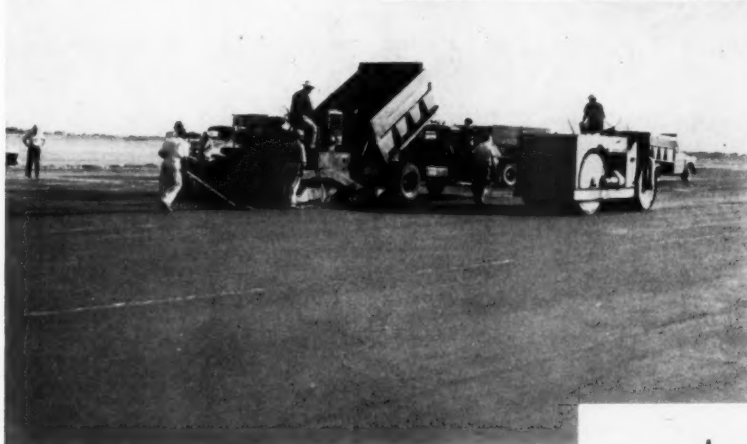
The most important factor in the future, as in the past, is the continuing appearance of more efficient machines on the market. If manufacturers continue to produce bigger, better machines enterprising contractors will seek them out as a means to bigger profits.

THE END



Man-hours of labor required per million dollars of highway construction expenditures, adjusted to 1954 bid price level and excluding right-of-way and engineering costs.

Answer to a paving problem at Houston International Airport

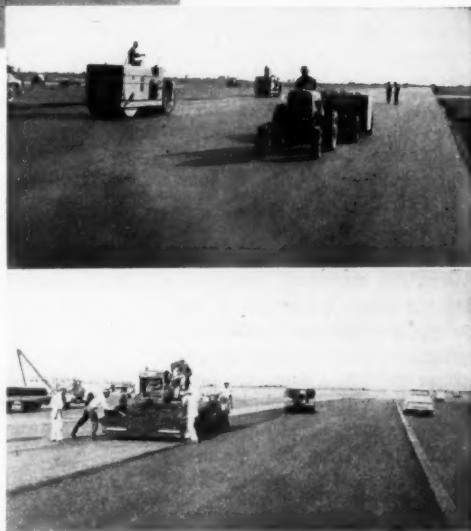


Photographs

(left) Laying initial course of 1-inch Texaco Sheet Asphalt on instrument runway of Houston International Airport.

(center) Rubber-tired and tandem rollers were used to compact Sheet Asphalt course.

(bottom) Constructing 3-inch coarse-graded Texaco Asphaltic Concrete binder course.



One of the nation's busiest air fields, Houston International Airport was confronted with the deterioration of 155,000 square yards of rigid type pavement on runways and taxiways. How to provide this large area with durable, economical paving, while subjecting plane traffic to a minimum of inconvenience, was the problem.

The answer was the construction of a heavy-duty plant-mixed Texaco Asphalt pavement in three courses over the defective runways and taxiways. Approximately 50,000 tons of asphalt mix was laid to a thickness of 5 1/4 inches. One inch of fine-aggregate Texaco Sheet Asphalt was laid first, partially filling cracks and leveling the old pavement. This was followed by 3 inches of coarse-graded Texaco Asphaltic Concrete and a 1 1/4 inch wearing surface of dense-graded Texaco Asphaltic Concrete.

Houston International Airport's Texaco-paved runways and taxiways combine rugged durability under heaviest air field traffic with a high degree of skid-resistance. Both initial cost and upkeep cost are lower than for comparable rigid paving. Snow melts more rapidly on a dark asphalt surface, an important advantage in many parts of the country.

Whether you are paving an airport, highway, street or parking area, there is a heavy-duty, intermediate or low-cost type of Asphalt construction to fit your requirements. Helpful information on all types is supplied in two free Texaco booklets which our nearest office will be glad to send you.



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TEXACO ASPHALT

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Recovery tunnel and conveyor, and inclined conveyor, are eliminated at the Johnson all-electric concrete plant by an unusual method of handling aggregates. Working from a ramp between stockpiles, a Lima Paymaster dragline charges aggregates to a surge hopper with a Hendrix $\frac{3}{4}$ -yard dragline bucket. The hopper feeds a Barber-Greene 120-foot conveyor leading to the bin atop the plant.

Dragline and conveyor feed aggregate to concrete mixing plant

Unique setup provides economical concrete production for spillway and outlet works of Ferrells Bridge Dam

by RALPH MONSON, field editor

To produce the 35,000 cubic yards of concrete needed for the spillway and outlet structures of Ferrells Bridge Dam near Jefferson, Texas, the contractor, Potashnick Construction, Inc., Cape Girardeau, Mo., set up a Johnson concrete plant with a unique method for feeding aggregates from stockpiles to the bins of the plant.

Working from an elevated ramp between the aggregate stockpiles, a Lima Paymaster crane with a Hendrix $\frac{3}{4}$ -yard dragline bucket picks aggregates from the storage piles and deposits them in a surge bin set up on a tower. A 120-foot-long Barber-Greene belt conveyor carries the sand and gravel from the surge bin to the rotary distributor at the top of the plant.

This unusual procedure eliminates a recovery tunnel and conveyor and the long inclined conveyor usually required between the tunnel and the bins. The dragline maintains the stockpiles on the ground, doing away with the need for a dozer and cutting down on the breakage of aggregates. Designed specifically for this project, the system works very efficiently for the volumes and rates of placing concrete in these structures.

Ferrells Bridge Dam is a rolled earth-fill dam with a concrete spillway and outlet works. The outlet

works consists of a gated intake structure topped by an operating house. A 10-foot-diameter double-barrel conduit extends 252 feet from the intake structure through the base of the dam. On the downstream side, a transition section leads the water to a stilling basin and then to the outlet channel.

The fixed-crest, 200-foot-wide spillway, adjacent to the outlet works near the east abutment of the dam, is 27.5 feet below the top of the earth embankment of the dam and has a capacity of 68,200 cfs. A three-span highway bridge will carry a roadway across the spillway.

Start outlet works first

Rough excavation for the spillway and outlet structures was done by the earthmoving crews, and much of the material went into the dam embankment.

Then the fine-grading for the footings of the structures was done by an Allis-Chalmers HD-5 Tractor-Shovel. While the spillway was still being excavated, crews started building the forms and placing concrete in the outlet structures.

Form sections were prefabricated in a carpenter shop, hauled to the job on trucks, and placed by a Lima Model 703SC crane with a 90-foot



As aggregates are delivered, cement is supplied from the 1,000-barrel silo, right, and water from the 5,000-gallon tank between the buildings, left. One building houses a turbine pump that delivers water from a 4-inch well. The other contains a booster pump. Here, the Koehring 2-yard tilt mixer is ready to fill buckets carried on a truck.

CONTRACTORS AND ENGINEERS

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boom. Some of these forms, especially those for the transition section at lower end of the double-barrel conduit, were very intricate and required skillful design and construction.

The odd shapes in these forms were cut from segments of planks and faced with 2-inch tongue-and-groove lagging. The construction joints between the several sections of the conduit and transition were fitted



A Lima Model 703SC crane with 90-foot boom swings a Heltzel 2-yard bucket of concrete to a form. Two buckets are delivered at a time by GMC Model 620 trucks. Altogether, three trucks and six buckets are enough to keep the crane at work.

with Serviced triple-bulb rubber waterstop.

The placing as well as the unloading and transporting of the 2.2 million pounds of reinforcing steel was sublet to J. B. Swafford, Contractors, Dallas, Texas. This subcontractor prefabricated much of the reinforcing into units that could be handled by a GMC boom truck or set in place with the crane.

Crane places concrete

Concrete was produced in the Johnson plant and hauled to the point of placement in Heltzel 2-yard bottom-dump buckets carried on GMC tandem-axle trucks. The big Lima crane picked the buckets from the trucks and swung them to the forms. Six of these buckets and three trucks maintained a constant flow of concrete from the plant to the forms.

The mix was vibrated in the forms by Jackson electric vibrators powered from REA lines. Concrete curing was done with cotton curing mats and water.

Coarse aggregate for the concrete was furnished by Braswell Sand & Gravel Co., Inc., Wilton, Ark., and was shipped by rail to Burford siding. Sand came from Gifford-Hill & Co., Inc., Texarkana, Texas. Both of these materials were unloaded from the rail cars by an under-track conveyor and fed directly to a fleet of 12 GMC Model 620 tandem-axle trucks with Heil 8-yard dump boxes. The trucks dumped the materials at the edges of the several stockpiles and the Lima Paymaster dragline handled them from there to the surge hopper.

Dragline feeds plant

The use of this small dragline was

the key to the efficiency of the plant setup. The dragline operated from an earth ramp built up about 12 feet above the surrounding ground. The aggregate stockpiles were arranged around the ramp so that all were within reach of the dragline. The stockpiles, separated by timber walls, were below the crawlers of the dragline under all ordinary operating conditions.

Trucks delivering aggregates dumped at the edges of the stockpiles. During times when the concrete plant

was not in operation, the dragline pulled the materials into neat piles, cleaning up so that the trucks could get right up to the stockpiles to dump.

When the plant was in operation, the dragline fed aggregates to the surge bin, which was mounted on a tower 35 feet high—about as high as the dragline could reach. The relatively short conveyor from the surge bin to the top of the plant looked a bit strange, but operated very efficiently.

Cement was received by rail at Bur-

ford siding, where the cars were unloaded by a Heltzel transfer plant having a storage capacity of 390 barrels. Covered dump trucks, hauling 60 barrels to the load, delivered the cement to the plant hopper. A screw conveyor and elevator took the material to the cement bin of the concrete plant or to the 1,000-barrel storage silo.

Three sizes of coarse aggregate, ranging from 3-inch to No. 4, were used for the mass concrete sections. On the thinner sections, the maxi-

How to put limestone and gumbo in their place



THIS is heavy going on a new section of four-lane U. S. 80 just east of Ranger, Texas. Collins Construction Co. of Austin put in 7.8 miles here and they handled 395,000 yards of material doing it. A lot of that was rock. And a lot was limestone and gumbo.

For this sort of heavy grading, Collins called in their CAT* No. 12 Motor Grader. "Finest all-around grader I ever saw," says veteran operator V. W. Nichols.

Notice that operator Nichols sits down to handle his No. 12, even in rough stretches like this. If an operator has to stand to see his work, he tires much quicker, no matter how good he is. The operator of a No. 12 enjoys the convenience of in-cab starting, too, and power steering, and the exclusive Caterpillar accelerator-decelerator. Most of all, he enjoys the assurance he's at the controls of a tough, reliable machine that's built to do the hard work.

Backbone of the No. 12 is the strongest frame in any motor grader now on the market. Special channels make it that way. Box section circles increase its durability, as do its box-type drawbars. And the engine is of the same hardy breed—clutch, transmission, final drive are built to take heavy motor grader service.

Other features help explain the No. 12's popularity with operators and owners, too. Fast, accurate mechanical controls. Anti-creep brakes. Blade maneuverability that lets you swing from ditch cut to bank cut in less than a minute without adjusting links. Your Caterpillar Dealer will give you full details—and a demonstration, any time. He's ready with expert service, also—and parts you can trust.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

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An Allis-Chalmers HD-5 Tracto-Shovel grades the base for a concrete form while a transition form is made ready for a pour, background. This form, shaping the invert for the transition between conduit and outlet channel, has construction joints fitted with Serviced triple-bulb waterstops.

mum size was 1½-inch. The 120-ton hopper of the concrete plant was divided into six bins, but only five were actually used on this setup for the three sizes of coarse aggregate, sand, and cement.

A typical 2-yard batch of concrete for some of the lighter sections consisted of:

Cement	952 pounds
Sand	2,184 pounds
¾-inch rock	2,160 pounds
1½-inch rock	2,160 pounds
N.V.R.	290 grams

Serviced air - entraining agent, N.V.R., was used in all of the concrete to produce an air content of about 5 per cent.

To obtain water for the mix, the contractor drilled a 4-inch well to a depth of 700 feet. A Fairbanks-Morse vertical-turbine pump raised the water from the well to a 5,000-gallon storage tank at ground level. Another pump boosted the water to the reservoir on the mixing platform of the tower.

Two-yard batches of materials were weighed out and chuted to the single Koehring 2-yard tilt mixer on the lower platform of the plant tower. The mixer discharged into a 4-yard hopper at which buckets loaded.

Concrete placing operations on the outlet works, started in the spring of 1956, will continue on through this year. The structure is scheduled for completion in the summer of 1959, but the contractor is planning completion ahead of that date. (See "Earthmoving, concrete placing moves ahead on Ferrells Bridge Dam", C&E, May, 1957, pg. 26)

Supervising the concrete placing operations for Potashnick Construction Co. is William T. Ogee. The man in charge of building and setting the forms is George Woner. The project manager for the contractor is Kenneth Damitz. Construction is being supervised for the New Orleans District of the U. S. Army Corps of Engineers by H. W. Fletcher, resident engineer. He is being assisted by C. L. Stafford and Lt. E. G. Moffatt. The project is being done under the supervision of the Shreveport, La., office of the Corps, which has H. R. McDowell as field assistant. The district engineer of the New Orleans District is Col. W. H. Lewis.

THE END

Prestressed concrete bridges topic of HRB text

Four papers in "Some Cost Data on Prestressed Concrete Bridges", Highway Research Board Bulletin 144, contain reports in five East Coast states and California during the 1951 to 1955 period.

The first paper covers six bridges in Massachusetts made of post-tensioned, I-shaped girders, 58 to 67 feet long, which support conventional poured-in-place concrete deck slabs. These bridges also have precast, pre-tensioned 4-foot-wide slabs containing large tubular voids that are suitable for quick installation in span lengths up to 40 feet. A report from

Florida gives design and cost information on both post-tensioned and pretensioned simple span structures.

Notable jobs in New York, New Jersey, and Virginia illustrate the lack of comparative cost data on prestressed and other types of construction. Cost comparisons of prestressed and conventional reinforced-concrete bridges are the topic of the California report.

The bulletin, priced at 80 cents, may be purchased by writing to Highway Research Board, located at 2101 Constitution Ave., Washington 25, D. C.

"Texaco Marfak stays in

reports The Arundel Corporation & L. E. Dixon Company

You can see why the Tulloch Dam is a tough job — and mid-summer heat makes it even tougher on bearing grease. "It's the stay-put quality of *Texaco Marfak* that's most valuable to us on this job. Even under heavy shock loads, *Texaco Marfak* stays in chassis bearings. It seals out dust and dirt — and prevents rust. It has meant longer life for our parts,

lower maintenance cost, and, above all, our equipment stays on the job."

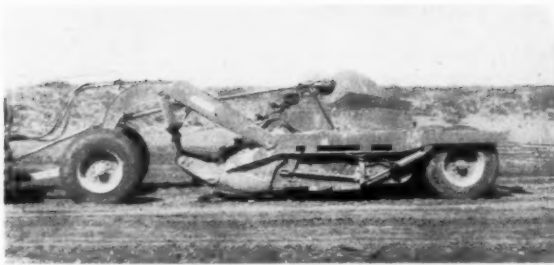
Mud and dirt are kept out of wheel bearings too by *Texaco Marfak Heavy Duty 2*. This assures safer braking and extra miles between lube jobs. No seasonal change is ever needed with *Texaco Marfak Heavy Duty 2*.

The builders also comment on the clean



TEXACO

A Hancock elevating scraper picks up blown sand on a state road project in New Mexico.



Case history

Elevating scrapers move 80 to 150 yards per hour

Edward Lively, Roswell, N. Mex., contractor, reports that his Hancock elevating scrapers have proved ideal for moving every kind of dirt an excavating contractor is likely to encounter.

On one job near Hagerman, N. Mex., Lively's crews were building 22

miles of state road through desert. Working in extreme heat and in dry soil and sand, Lively's three Hancock scrapers hauled, loaded, elevated, and spread between 80 and 150 cubic yards each per hour. Blown sand accounted for a considerable volume of the material handled. Eight and eleven-cubic-yard models were used.

Lively also found the scrapers ca-

pable of the same high production on a job at the Santa Fe Municipal Airport. In both cases, the contractor used John Deere Model 80 tractors.

For further information about these Hancock scrapers, write to the Hancock Mfg. Co., Dept. C&E, P. O. Box 1359, Lubbock, Texas.

Circle No. 224.

ysin the bearings longer"

any... of their diesel engines which use *Texaco Urso Oil Heavy Duty*. Like all *Texaco Urso* oils it makes diesels and heavy duty gasoline engines deliver more power with less fuel over longer periods between overhauls.

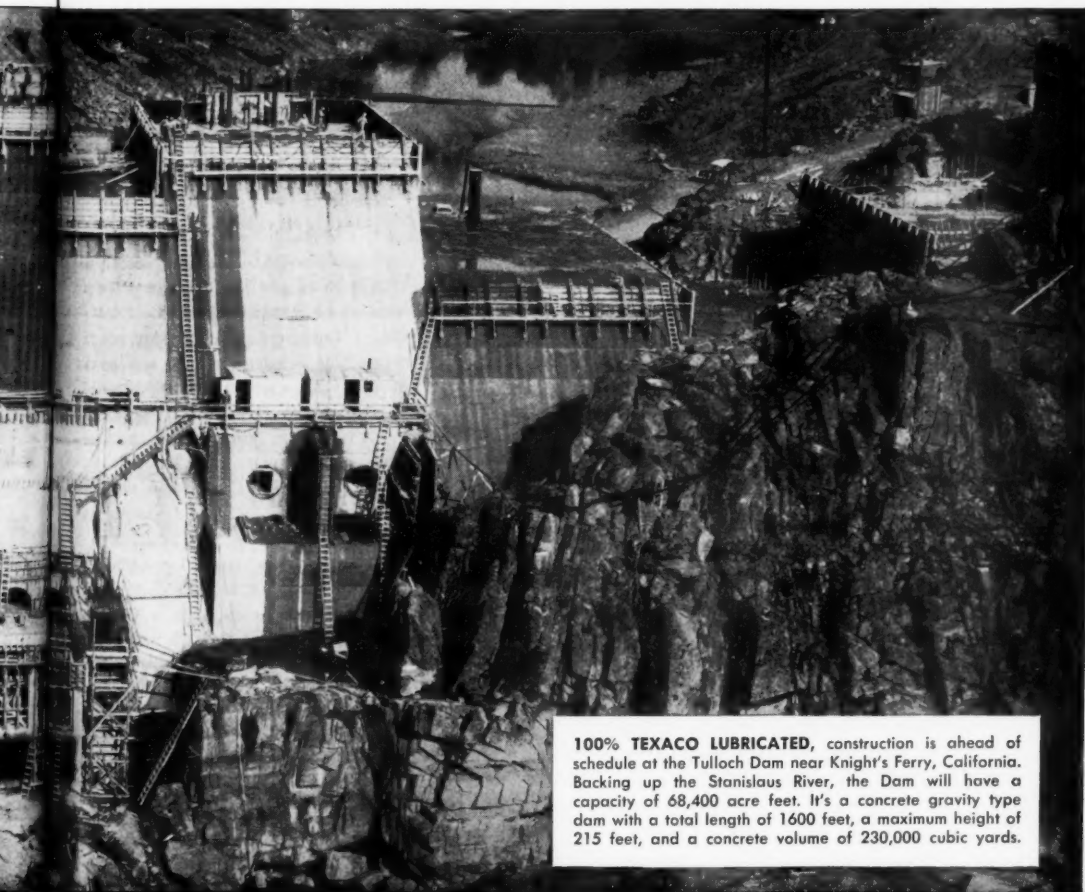
Your crawler mechanisms will work smoother when fully protected like those on the Tulloch Dam job with *Texaco Track Roll Lubricant*. And you'll be sure your drills—running or idle—are protected against rust

with *Texaco Rock Drill Lubricant EP*.

ASK A TEXACO LUBRICANT ENGINEER to set up a Texaco Simplified Lubrication Plan for your project. All you have to do is call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

☆☆☆

The Texas Company, 135 East 42nd Street, New York 17, N. Y.



100% TEXACO LUBRICATED, construction is ahead of schedule at the Tulloch Dam near Knight's Ferry, California. Backing up the Stanislaus River, the Dam will have a capacity of 68,400 acre feet. It's a concrete gravity type dam with a total length of 1600 feet, a maximum height of 215 feet, and a concrete volume of 230,000 cubic yards.

Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

For more facts, use Request Card at page 18 and circle No. 353

Convention calendar

June 11-14 Western Association of State Highway Officials

Meeting, Shamrock-Hilton Hotel, Houston, Texas. D. C. Greer, president, WASHO, State Highway Engineer, Texas State Highway Department, Austin 14, Texas.

June 13-14 American Bridge, Tunnel, and Turnpike Association

Meeting, Mayflower Hotel, Washington, D. C. J. Allyn Stearns, executive secretary, ABTTA, P. O. Box 748, White Plains, N. Y.

June 16-21 American Society for Testing Materials

Annual Meeting, Chalfonte-Haddon Hall, Atlantic City, N. J. Fred F. Van Atta, assistant secretary, ASTM, 1916 Race St., Philadelphia, Pa.

June 17-21 American Society for Engineering Education

Sixty-fifth Annual Meeting, Cornell University, Ithaca, N. Y. W. Leighton Collins, secretary, ASCE, University of Illinois, Urbana, Ill.

June 24-29 Concrete Reinforcing Steel Institute

Meeting, The Greenbrier, White Sulphur Springs, W. Va. H. C. Delsell, managing director, CRSI 38 S. Dearborn St., Chicago 3, Ill.

June 24-25 Wire Reinforcement Institute

Annual Spring Meeting, The Greenbrier, White Sulphur Springs, W. Va. Frank B. Brown, managing director, WRI, 1049 National Press Bldg., Washington 4, D. C.

July 8-10 American Society of Landscape Architects

Fifty-eighth Annual Meeting, Sheraton-Palace Hotel, San Francisco, Calif. Prentiss French, trustee, ASLA, 306 Grant Ave., San Francisco 8, Calif.

July 8-10 School for Highway Superintendents

Conference, Cornell University, Ithaca, N. Y. Prof. J. W. Spencer, SHS, Riley-Robb Hall, Cornell University, Ithaca, N. Y.

July 14-17 National Association of County Officials

Twenty-first Annual Conference and Exhibit, Dinkler-Plaza Hotel, Atlanta, Ga. Keith L. Seegmiller, executive secretary, NACO, 1616 Eye St. N. W., Washington 6, D. C.

July 29-August 2 Prestressed Concrete Conference

International Conference, sponsored by Prestressed Concrete Institute and University of California, Fairmont Hotel, San Francisco, Calif. Department of Conferences and Special Activities, University Extension, University of California, Berkeley 4, Calif.

August 1-10 Pan-American Highway Congress

Congress, Panama City, Panama. Francisco J. Hernandez, chief of travel division department of economics and social affairs, PAHC, Organization of American States, Pan-American Union, Washington 6, D. C.

August 26-30 National Shade Tree Conference

Conference, Sheraton Hotel, Philadelphia, Pa. L. C. Chadwick, secretary-treasurer, NSTC, Department of Horticulture, Ohio State University, Columbus, Ohio.

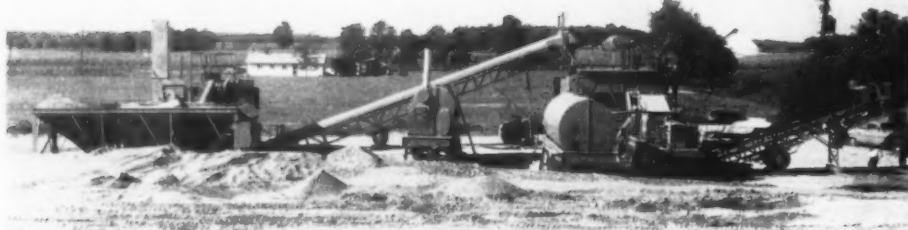
B-E names general manager

Henry M. Jameson has been appointed general manager of the Drill Division, Bucyrus-Erie Co., South Milwaukee, Wis. Jameson will make his headquarters at Richmond, Ind.

The company is building a new plant which will provide 300,000 square feet of floor space for the manufacture of B-E's line of water well drills, blast hole drills, etc.



Three hot-mix setups work one quarry for different jobs



The Hetherington & Berner plant set up by the Brewer Co., Madera, Ohio, had its own wheel mountings, and several units were joined by long sloping belt conveyors to eliminate a tower and high elevated bins.



Quoting H.E. (ACE) GREEN, tunnel superintendent: "EIMCO 105 Excavators with heft to dig fast and overhead discharge, are the fastest tunnel loaders I've worked with."



The project was organized on a two cycle, 24 hour timetable with two drill and two mucking shifts. Here, Eimco 105 and dump wagons wait out blasting operations.

Quoting J. E. R. WOOD, president, NORTHWOOD INC.: "The fact that we have four EIMCO 105's is proof we're sure they promote high tonnage production."



WILKES-BARRE, PA. - Operator JOSEPH WEIKEL of Pottsville, Pa., prepares to unleash the EIMCO 105 Excavator's tremendous digging power during Bear Creek Diversion Tunnel operations. His comment: "It's the digginest machine I've operated."

The 19' circular bore was blasted through 1,150 feet of rock by NORTHWOOD INC. U.S. Army engineers directed the project.



EIMCO 105 SAVES TIME MUCKING FOR TUNNEL DRIVERS

"SAVES MINUTES EVERY CYCLE." That's how AL AITKEN, V-P, NORTHWOOD INC., supervisor of Bear Creek Tunnel operations, describes the EIMCO 105 Excavator's performance.

Part of the \$18 million Bear Creek Reservoir Project, this tunnel will be outlet channel for the 234' high earthen dam. NORTHWOOD, with main offices in Vancouver B.C., is one of the Continent's active tunnel drivers.

Equipped with 1½ yard excavating bucket, the EIMCO 105 loaded 100 cubic yards of material into dump wagons after each blast.

Between 200 and 400 lbs. of dynamite, used in a 48-hole drilling and shooting pattern (usually fired in 10 stages of delay) produced an average advance of 7½' per round ... 15' per day.

The tunnel was drilled to a bore size of 19' in the rough using 6 jack legs on a single deck jumbo. Concrete lining will reduce inside diameter to 16'. Six inch I-beam supports wedged tightly with wooden blocking are spaced every 4'. The EIMCO 105 now is taking up a 4' bottom left to provide flat surface for trucks.

NORTHWOOD'S high appraisal

of the EIMCO 105 is duplicated often in field reports from tunnel projects and mines throughout the world.

With any attachment - Excavator, Front-End Loader, Bulldozer, Fork Lift, and others - EIMCO 105 owners get superior design ... performance speed and power ... operating ease and economy ... versatile maneuverability ... dependable service under hard usage.

Plan now to learn why you can shade your next bid and still keep the profit by figuring earthmoving costs around the EIMCO 105.

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For more facts, use Request Card at page 18 and circle No. 354

Operating at the same time in one quarry, three bituminous paving plants produced a high output for each contractor working on separate Indiana state highway jobs on nearby roads. To make the job more unusual, the three contractors used different plant setups—a brand new Hetherington & Berner, an old Barber-Greene, and a portable Hetherington & Berner.

One of the jobs was the widening and resurfacing of an old bituminous pavement on highway U. S. 421 southwest of Versailles. Another was resurfacing an old concrete pavement on state highway 101 south of Milan, Ind., and the third was a new base and paving on a regraded section of state highway 129 southwest of Versailles, Ind.

The contractors on the three jobs were L. P. Cavett Co., Lockland, Ohio, on highway 421; the Brewer Co., Madera, Ohio, on highway 101; and Stone City Construction Co., Inc., Bedford, Ind., on highway 129. All of the work was planned and supervised by the Indiana State Highway Department.

Resurface concrete pavement

The old 20-foot-wide concrete paving on highway 101 from its junction with U. S. 50 north to Milan was first widened to 24 feet by the State Highway Department's maintenance crews. The Brewer Co. then set up a new Hetherington & Berner Mobile 40 plant for its first workout producing the binder and surface course materials.

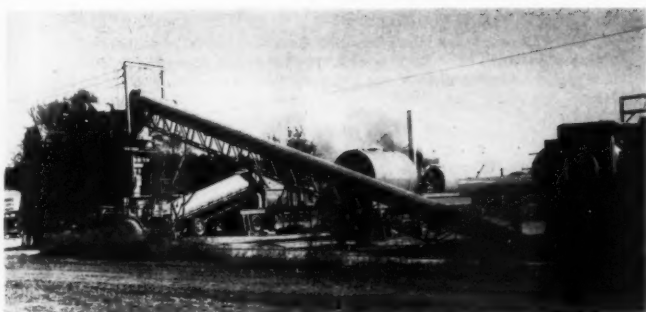
The widening strips were subsequently built up to the old pavement grade by successive lifts of bituminous binder. This material was placed by a Blaw-Knox Apsco Model 85 widener and compacted with a Gallion trench roller. The full 24-foot-wide pavement was resurfaced with bituminous binder and surfacing. The pavement surface was swept clean with a Grace tow-type broom and tacked with a light shot of cutback asphalt by a Littleford distributor mounted on a GMC truck.

Bituminous materials, trucked from the plant, were laid by a Blaw-Knox spreader and compacted by a Buffalo-Springfield 10-ton tandem and 3-wheel rollers. Bill Dobson supervised this phase of operations for Brewer.

Brewer plant setup

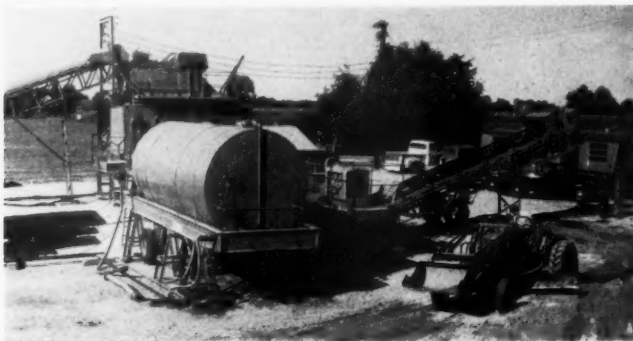
Since Brewer had quite a lot of

CONTRACTORS AND ENGINEERS



Most of Brewer's plant operations were governed by a Hetherington & Berner automatic cycle control, which opened and closed the hot-material bin gates, dumped the weigh box, introduced asphalt cement, and did the mixing.

Immediately behind Brewer's asphalt storage tank is the gradation unit with air-controlled bin gates. From the gradation unit, the aggregates travel to the 4,000-pound pugmill, powered by a GM 4-71 diesel engine, to the 36-inch X 40-foot belt which carries the batch to the trucks.



preparatory work on the 8-mile section, bituminous work did not get underway until about the time the other two contractors were winding up their operations.

The new Hetherington & Berner plant set up by Brewer had several interesting features. Each element of the setup had its own wheel mountings, and several units were joined by long sloping belt conveyors, to eliminate a tower and high elevated bins. Though the several units were arranged in a nearly square pattern for a minimum of ground room, all parts were readily accessible for servicing.

A Lorain motor crane with an Owen 1-yard clam transferred aggregates from the stockpiles to the three compartments of a 45-ton bin. An 18-inch 65-foot-long belt conveyor carried the sand and stone from the bin feeders to a 70-inch X 24-foot oil-fired dryer. Mounted beside the dryer was the dust control unit and a General Motors 6-71 diesel power unit.

Other units

Another 18-inch X 70-foot conveyor belt, covered to prevent fines from blowing off, carried the hot dry aggregates to the gradation unit. At the top of the unit was a Deister 4 X 10-foot 3-deck screen with the hot material bins and the weigh unit below it.

From a platform at the end of the gradation unit, the operator actuated the air controls to open and close the bin gates to weigh out the ingredients of the mix. The start and stop buttons for the other units of the plant were also at the operator's fingertips. The operation of most of the plant units was governed by the H&B automatic cycle control, which opened and closed hot material bin gates, dumped the weigh box, introduced the asphalt cement, and did the mixing.

From the gradation unit, the proportioned aggregates traveled by covered conveyor to the mixing unit's 4,000-pound pugmill. Asphalt cement was introduced into the pugmill through a fluidometer that accurately metered out the specific amounts. The mixed batch was then carried by a 36-inch X 40-foot belt to the trucks that hauled to the road.

The mixer was powered by a GM 4-71 diesel engine; all other units,

(Continued on next page)

NOW There's no job too tough for tubeless tires



—When they're mounted on Tru-Seal Rims

Tractor shovel on Goodyear tubeless tires scoops up 10-inch concrete slabs, near Lansing, Michigan.

HERE YOU SEE a sample of what tubeless tires have to take—in today's mammoth construction projects. How did tubeless tires get into this picture—and so successfully, too?

One of the biggest reasons is Goodyear's development of the Tru-Seal Rim. This is the rim that has been adopted as standard by the Tire and Rim Association for tubeless replacement of all conventional tires sizes 12:00 and larger.

Tru-Seal is the only practical method yet devised to seal a multiple-piece rim. It adds one more to the many benefits Goodyear's vast tire-building experience brings to rim construction. With Goodyear rims, you profit by such advantages as:

Unusual Strength: Thanks to an exclusive double-welding process, and added support at points of greatest stress, present-day Goodyear Rims are far stronger than previous rims.

Ease of Tire Mounting: No tube and flap troubles.

Special Tools: Goodyear alone provides both hydraulic and hand tools especially made for off-the-road equipment.

Bond-a-Coat Finish—This protective coating affords long-lasting resistance to rust and corrosion.

If you have a rim problem, why not talk it over with the G.R.E. (Goodyear Rim Engineer). He'll save you time and money by helping you select the type and size of rim best suited to your needs. Write him at Goodyear, Metal Products Division, Akron 16, Ohio, or contact your local Goodyear Rim Distributor.

New Tru-Seal Rims—for sizes 12:00 and up, including all earth-mover and grader sizes. This rim is similar to multiple-piece rims now in use—PLUS airtight Tru-Seal rubber ring which compresses into sealing groove when tire is mounted.



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Tru-Seal—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

MORE TONS ARE CARRIED ON GOODYEAR RIMS THAN ON ANY OTHER KIND

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L. P. Cavett Co., Lockland, Ohio, used an old Barber-Greene plant that turned out 90 tons of mix per hour for the widening and resurfacing of U. S. 421. Here a General crane with Blaw-Knox 1½-yard bucket charges the bins of the B-G plant.

(Continued from preceding page)

except the dryer-dust collector assembly, were powered by electric motors taking their current from a nearby high line.

Brewer's plant superintendent, Charles Zagar, had the dismantled plant ready for transport in three days, and took another three days to have it back in operation at the new location.

Cavett plant

In contrast to Brewer's brand new plant, the L. P. Cavett Co. had an

old Barber-Greene plant. However, this plant turned out a satisfactory mix at rates up to 90 tons per hour.

The plant contained a B-G No. 816, 3-compartment, 24-yard feed bin with reciprocating feeders discharging the aggregates via a bucket conveyor to two B-G No. 833 oil-fired dryers. The hot materials traveled by bucket conveyor to the 4x8-foot 3-deck screen of the gradation unit. From there the materials were proportioned through calibrated gates to the B-G No. 848 continuous pugmill mixer.

Asphalt cement was trucked from the refinery to a 16,000-gallon storage tank at the plant. A coal-fired steam boiler kept the asphalt heated, and a calibrated asphalt pump delivered the required amount to the spray bar of the pugmill.

The plant, powered by an International UD-16 engine on the pugmill and a UD-18 on the dryers, turned out binder and surface course materials for widening and resurfacing 12 miles of old 20-foot-wide bituminous paving on U. S. 421. The binder mix contained stone graded from 1½-inch down, sand, and about 4.5 per cent asphalt cement. The surface course contained ½-inch stone, sand, mineral filler, and about 6.5 per cent asphalt cement.

Widening operations

In widening the old pavement, the contractor first had a Buckeye Model 816 wheel trencher excavate a 10-inch-deep trench along both sides of the old road. One inch of fine base course aggregate was laid in the bottom of the trenches and rolled. Three successive 3-inch binder courses were then placed and rolled to bring the widening strip up to the pavement grade.

The binder was placed by a Blaw-Knox Apsco widener and compacted by Gallon and Apsco trench rollers. The first 3-inch course was laid 33 inches wide, and successive courses were stepped in 3 inches each to strengthen the outer edge of the pavement.

Leveling courses were applied to the old pavement to correct settlements or imperfections before resurfacing began. An Adnun spreader laid the resurfacing binder course at a rate of 170 pounds per square yard, and the surfacing course at 80 pounds per square yard. Gallon 10-ton tandem and 3-wheel rollers compacted both courses. All of Cavett's work was supervised by job superintendent Charles Midlam and plant superintendent Rollin Phillips.

New base and paving

The third contractor using the Frank quarry site, Stone City Construction Co., Inc., regraded and paved a 6-mile section of highway 129 southeast of the junction with

U. S. 421 of a 7-in. base, with bituminous by a Het paver.

The base material loose lift spreader 10-Spring A Jack worked li The base ter, and at a rate by a 1.0 tributor truck.

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This quarry oil-fired a surge dozed t 175A tr the dr second dried 1 bin th Bob Stone project

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In t drilled soll-R Le Ro Worth compr was d feet. 7 with mite Koe loader

NEW Escolite

ELECTRONIC SPECIALTIES CO. BATAVIA, ILLINOIS

the Electric Flashing Warning Light for Road Builders and other Contractors



Compare these Features

✓ SAFER — light is brighter, flashes stay on longer, easier to see.

✓ HEAVY DUTY — built for hard use in all weather conditions.

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The aggregates are heated and dried in Cavett's two Barber-Greene No. 833 oil-fired dryers. The hot aggregates, carried by bucket elevators to the B-G gradation unit, are fed through calibrated gates to a pugmill mixer which discharges to trucks.

U. S. 421. This pavement, consisting of a 7-inch water-bound macadam base, was surfaced with two 1-inch bituminous courses mixed and laid by a Hetherington & Berner motor paver.

The open-graded crushed rock base material was placed in a 10-inch loose lift by a Blaw-Knox Apsco spreader and compacted by a Buffalo-Springfield 10-ton 3-wheel roller. A Jackson vibratory compactor worked limestone fines into the voids. The base was then flushed with water, and primed with cutback asphalt at a rate of 0.2 gallon per square yard by a 1,000-gallon South Bend distributor mounted on a Mack A-30 truck.

Aggregates, dried in a plant at the quarry site, were trucked to the road and then dumped into a Hetherington & Berner motor paver. The materials usually left the plant at about 180 degrees and were mixed in the travel plant with RC-4 cutback asphalt and laid at about 150 degrees. As the first 1-inch surfacing course was laid by the motor paver, a Gallon 10-ton tandem and a Buffalo-Springfield 10-ton 3-wheel roller compacted the surface. About 5 pounds per square yard of rock chips were spread over the first course before the second 1-inch lift was laid.

The second surface course was sealed with RS-2 emulsified asphalt in which limestone chips were embedded at a rate of 14 pounds per square yard. The chips were applied by a Hy-Way chip spreader and rolled by the Galion tandem roller.

This contractor's plant at the quarry site consisted of a Madsen oil-fired dryer, a bucket elevator, and a surge bin. Stockpiled aggregates, dozed to a trap by a Michigan Model 175A tractor-shovel, were elevated to the dryer by a bucket conveyor. A second bucket conveyor raised the dried material to an elevated surge bin that loaded trucks by gravity.

Bob Boruff was superintendent for Stone City Construction Co. on this project.

Quarry supplies rock

All three contractors used crushed rock coarse aggregate from the Paul Frank, Inc., quarry, which was supervised by Paul Frank. Some also used limestone chips and mineral filler supplied by Frank. Sand was trucked in from Carrollton, Ky.

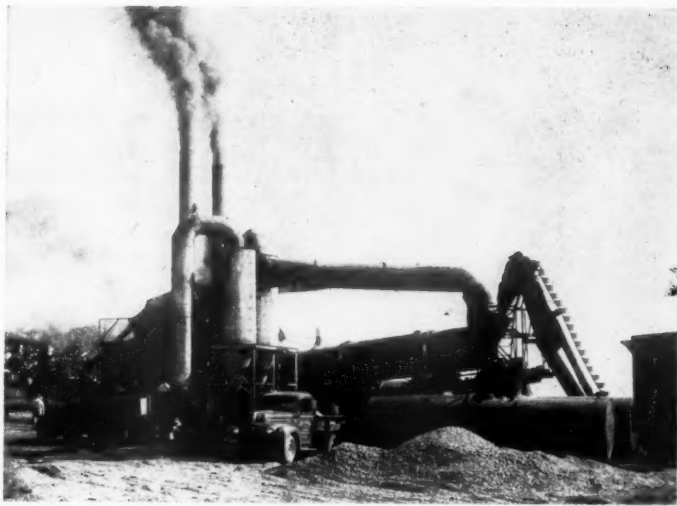
In the quarry, the limestone was drilled by Worthington and Ingersoll-Rand wagon drills powered by a Le Roi 315 portable compressor and a Worthington 365-cfm stationary compressor. The 35-foot rock face was drilled in two lifts of 24 and 11 feet. The 2½-inch holes were loaded with Atlas 40 and 50 per cent dynamite and detonated electrically.

Koehring 401 and 604 shovels loaded the shattered rock into three

15-ton Mack trucks hauling to the Pioneer crushing and processing plant. The material first went to a 30×42-inch jaw crusher and then by conveyor to the screens and secondary crushers.

The secondaries were a 54×24 triple roll crusher and a 40×22 double roll crusher in closed circuit with the screening plant. The all-Pioneer plant produced materials from 4-

(Concluded on next page)



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The third contractor, Stone City Construction Co., Inc., Bedford, Ind., used a Hetherington & Berner travel plant, Madsen oil-fired dryer, two bucket conveyors, and an elevated surge bin.

(Continued from preceding page)

inch size down to agricultural lime, delivering the finished materials to eight bins that loaded trucks by gravity.

When possible, the aggregates were hauled directly from the bins to the jobs. Surpluses, hauled to stockpiles, were later rehandled by a Haiss stockpile loader and a Michigan Model 175A tractor-shovel.

All of these projects were supervised from the Seymour District office of the Indiana State Highway

Department. R. H. Harrell is district engineer. The project engineer on the job on highway 129 was R. B. Sutherland. On the work on highway 421, J. E. Bellamy was the State Highway representative, and on the highway 101 job, the highway department was represented by project engineer W. E. Pettitt. The Chief engineer of the Indiana Department is Carl E. Vogelgesang. The Engineer of road construction is F. L. Ashbaucher.

THE END

**"THIS IS THE
MACHINE
WE'VE BEEN
LOOKING FOR!"**



**The D9 is not only a great bulldozer but in good material
it loads a DW21-Scraper unit in 25 to 30 seconds
for Copper State Construction Co.**

The CAT* D9 Tractor shown here is building a clover leaf on U. S. 70, some 20 miles east of Globe, Arizona. Copper State Construction Co., of Mesa, Ariz., has the 70,000-yard contract. On hauls of 1200 to 2200 feet each way, three rubber-tired rigs are handling about 4500 cubic yards per day, with cycle times of about 4½ minutes. In tough, unripped material tandem pushers are used, loading a DW21 and Scraper in about 30 seconds. Where material is better, the D9 alone does the loading job in 25 to 30 seconds.

Superintendent Roy Hale says: "This D9 is the machine we've been looking for. We like the torque converter. It gives smooth operation and will lengthen the life of the tractor."

Much of the new D9's high work output is due to its Cat Diesel Engine—the first Turbocharged engine on any track-type tractor. It now develops 320 HP at the flywheel. The D9 is available with torque converter or

exclusive oil clutch, to suit your needs. And it offers in-seat starting, hydraulically boosted controls, smooth, constant power drive for cable controls and excellent operator visibility. It's as easy to handle as many smaller tractors.

See your Caterpillar Dealer and let him *prove* that this "King of the Crawlers" can do more work at lower cost on *your* job.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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YOUR DEALER
WILL DEMONSTRATE**

For more facts, use Request Card at page 18 and circle No. 358

Case history

Microwave system aids parkway maintenance

Microwave towers have taken their place with white egrets in the landscape of Florida's southeast coast.

The towers are representative of an ultramodern General Electric two-way radio and microwave relay system which is facilitating communications between police and maintenance crews patrolling the first completed section of the Sunshine State Parkway.

Stretching through terrain varying from swamps to woods and ranchlands, the new system links 26 patrol cars and 26 maintenance vehicles with turnpike toll plazas and administrative personnel from Miami to Fort Pierce.

Thomas B. Manuel, chairman of the Florida State Turnpike Authority, says the radio network is "functioning with exceptional dependability and has proved to be a tremendous asset to the control and operation of the turnpike facility". He adds that it has contributed heavily to the Authority's program of taking the hazards out of toll-road driving.

The microwave portion of the network is used to carry two VHF channels as well as three telephone dial channels, a service channel, and associated fault and supervisory services. The VHF ties together toll plazas, maintenance area, interchanges, and mobile units on a common party-line basis. A station at McArthur is the control center for the equipment, which includes five stations, two terminals and three "drop and insert" repeaters paralleling the Parkway from McArthur north to the Stuart interchange.

Since much of the work of police and maintenance crews is emergency in nature, a high degree of equipment reliability is mandatory. To accomplish this, a built-in supervisory control and fault alarm channel is included. From McArthur, a pulse is inserted into the channel continuously and is conveyed over G-E tone dispatchers at the console. When a fault occurs at a remote station, the tones identify the station as well as the fault and the lights are activated on the console. The fault detected, automatic switching to auxiliary or standby equipment is effected.

A progress report on the turnpike, prepared for the Turnpike Authority by the Parkway's consulting engi-

CONTRACTORS AND ENGINEERS



A Davis 210 backhoe digs 18-inch-wide trench for building footings immediately adjacent to an existing building. Neither foundation or compacted ground are disturbed.

Case history

Backhoe digs footings in cramped quarters

Without disturbing the compacted ground where a new building was to be constructed flush with two existing structures, D. L. Decker Construction Co., Wichita, Kans., dug footings with a small, versatile backhoe and realized a considerable saving in labor costs.

Decker used a Davis Model 210 backhoe to dig the 18-inch-wide footings alongside the existing structures—one 162 feet long and the other 47 feet long. The footings went to 6 feet deep under the piers.

The Davis unit has three interchangeable mounting points on the frame, so that the operator can move the mast and boom from center to side for flush digging next to any obstacle. Because of the exclusive hydraulic rotary boom swing cylinder, the backhoe has a 185-degree cushioned operating arc when center-mounted, and at least 200 degrees when side-mounted.

These features made it possible for Decker's operator to swing the dirt far enough from the trench so that there was no fall-off that had to be cleaned out later.

D. L. Decker, owner of the construction firm, estimated the cost of the operation with the Davis backhoe at 20 cents a foot, as compared with an anticipated \$2.50 a foot for hand digging. Larger digging equipment was not considered because of the danger of tearing up several feet of compacted virgin soil that made an excellent bed for the new concrete flooring.

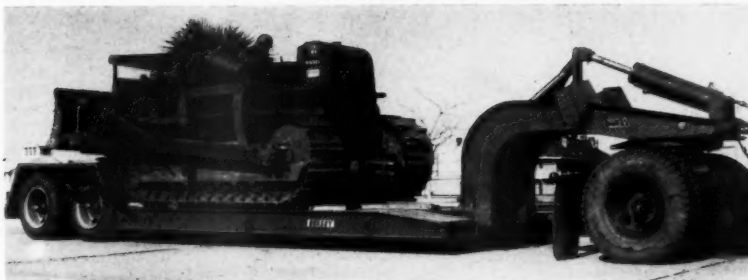
For further information about the Davis backhoe write to Mid-Western Industries, Inc., Dept. C&E, 1009 S. West St., Wichita 15, Kans.

Circle No. 33.

(Continued from preceding page) neers, says that the new radio system has "greatly enhanced rapid detection and correction of both operating and maintenance problems".

For further information on these relay systems write to the Communications Products Dept., General Electric Co., Dept. C&E, Electronics Park, Syracuse, N. Y.

Circle No. 230.



A new low-bed trailer with removable gooseneck is announced by Dorsey Trailers, Inc. Available in capacities of 15 to 75 tons, the trailer is said to make one-man loading and unloading a simple matter with the removable gooseneck. A hydraulic system lowers the front end to the

ground for loading and unloading, and lifts it back into running position. The deck of these units can also be lowered or raised 2 inches from standard position for extra overhead or ground clearance. Dorsey Trailers, Inc., Dept. C&E, Elba, Ala. Circle No. 78.

"in the long run, we get MORE DOLLARS out of our MADSEN ASPHALT PLANTS"



Says...

R. C. (Bob) SULLY
Vice President
SULLY-MILLER
CONTRACTING CO.
LONG BEACH, CALIFORNIA

Engineering Data...

Concerning Sully-Miller's
6000-lb. Madsen Asphalt
Plant shown.

- PLANT MODEL... Madsen Model 481 — 6000-lb. batch capacity.
- SCREEN... 48" x 16' Symons 2 1/2' deck.
- DRYER... 96" x 30'.
- BURNER... 12" combination gas and oil.
- DUST COLLECTOR... 12' dia. cyclone and 65 tube multiclone.
- WET SETTLING EQUIPMENT... Madsen Triple Wet Tube Dust Washer—one 6' x 12' and two 6 1/2' x 12' tubes.
- TYPE OF FEED... Tunnel to cold stone elevator.
- PLANT SET UP INCLUDES... dust elevator, dust bin and dust entering screw.



Equipment that Serves

Ask your MADSEN Distributor for Catalog No. 800 or write MADSEN Works, Baldwin-Lima-Hamilton Corporation P.O. Box 38, La Mirada, California.

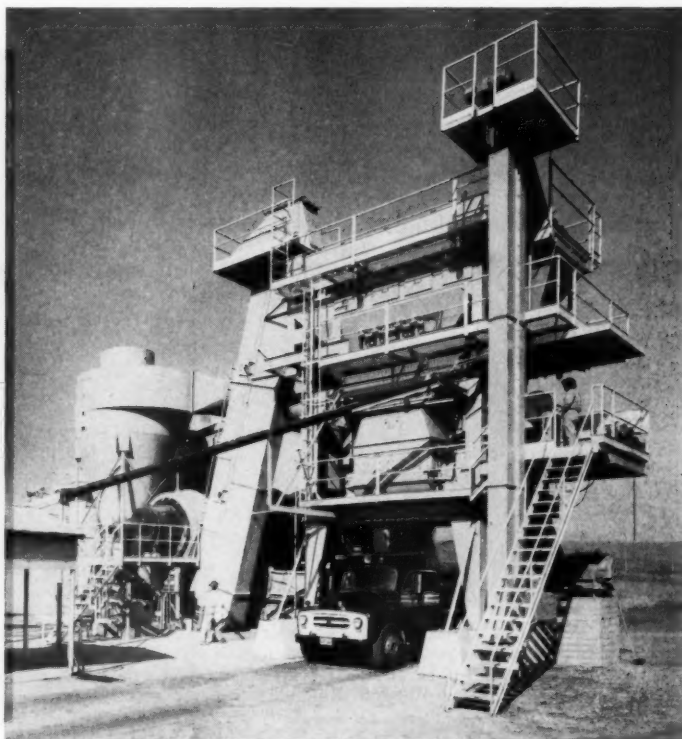
THE MADSEN LINE OF PRODUCTS
FOR THE ASPHALT PAVING INDUSTRY
INCLUDES

ASPHALT PAVING PLANTS • PUG MILL MIXERS • AGGREGATE DRYERS • DUST COLLECTOR UNITS
ROAD PUG TRAVEL-MIX PLANTS • WEIGH BATCHERS • SUPER FLOAT AND JOHNSON FLOAT FINISHERS
ASPHALT TANKS • ROYAL CROWN PUMP VALVES • ASPHALT AND FUEL PUMP UNITS



MADSEN WORKS
BALDWIN-LIMA-HAMILTON
CONSTRUCTION EQUIPMENT DIVISION
DIVISIONS: Austin-Western • Eddystone •
Electronics & Instrumentation • Hamilton •
Lima • Loewy-Hydropress • Madsen • Pelton
• Standard Steel Works

For more facts, use Request Card at page 18 and circle No. 359



Sully-Miller Contracting Co. is one of the largest suppliers of asphalt and asphalt paving in Orange County and southern Los Angeles County. Like other leading producers of asphalt, the prime concern of this contractor is to get big-volume, money-making production day-in and day-out from his asphalt plants. That's why he's mighty glad to have the MADSEN Model 481 6000-lb. plant, shown above, on the job. It's one of several MADSEN Asphalt Plants owned by this successful operator.

The sturdy, oversize construction of MADSEN Plants means greater sustained production. With our new MADSEN 6000-lb. Plant, Bob Sully says "we can turn out approximately 2000 tons per day of close specification mix."

The MADSEN Model 481 Asphalt Plant offers many superior engineering features. For example: the exclusive MADSEN bin design (patent pending) which eliminates segregation... fast, accurate, all-air operation of bin gates, asphalt pressure injection and mixer gate... oversize capacity weigh-box, roller mounted so that it may be quickly rolled out of the way for easy field maintenance... the famous MADSEN Model 440 Twin-Shaft Pug Mill Mixer with improved mixing action... and the patented MADSEN Pressure Injection System.

Whether you are an established operator or a newcomer in the asphalt business—you'll want to get all the facts on the MADSEN Model 481 Asphalt Plant. This outstanding plant is available in 4000-lb., 5000-lb. and 6000-lb. batch capacities to meet your needs.



As the concrete is spread by the Quad City slip-form paver's hydraulically retractable screed, it is consolidated by a pan vibrator and tamping bar. A stationary strikeoff shoe trowels the surface as the rig is pulled along.



Slip-form paver reduces manpower

Slip-form pavers, finishing more than 77 miles of concrete pavement in Iowa, have established themselves in good favor with both the contractors and highway engineers.

Work in the tall corn state last season ranged from city streets and county roads to primary state highways, and all of the jobs were finished concrete pavements.

Using a Quad City paver in a typical rural operation, one of these contractors, Hallett Construction Co., Crosby, Minn., paved a 7-mile section of county road in Greene County near Paton, Iowa. The 20-foot-wide 6-inch slab was placed on a very narrow roadbed graded high above adjacent land and given very narrow shoulders. All this made it necessary for the contractor to carry on all paving operations from the roadway area.

The Quad City slip-form paver replaced all of the machines in the conventional finishing train and eliminated the use of the usual stationary side forms. Taking concrete from a Koehring 34-E Twinbatch paver, the Quad City slip-form machine spread the mix on the base, vibrated and tamped it, then struck off the slab to grade and gave it a belt finish.

All of these operations were done as the machine moved along at an average rate of better than 4 feet per minute. The usual form-setting crew was completely eliminated, and the only hand finishing required was a longitudinal straight-edging following the power belting. In one 11-hour day, the crew placed 2,800 linear feet of the 20-foot slab.

Subgrade preparation

This section of road had been graded to a 26-foot-width in about 1942, and maintained since that time as a gravel road. The grading top, widened out to about 30 feet by years of dragging, had relatively steep shoulder slopes. The grade had been built up above the surrounding ground so that the prevailing wind would help keep the road clear of snow during the winter.

Prior to the start of the contractor's operation, county forces had trued the grade and surface of the road. The old gravel surfacing served as base, and there was little work required to prepare the subgrade.

Working from a string line on each side of the road, a Cleveland Form-grader cut a smooth path to accurate grade for the tracks of the planer and the slipform machine. This form grader was equipped with a track on the drive wheel for positive traction

←For more facts, use coupon or circle No. 360

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JUNE

SAVE MANPOWER

ON CONCRETE JOBS WITH Whiteman EQUIPMENT



One man with a Whiteman Power Buggy can pour as much concrete in one day as five men with hand buggies. Speed over narrow runways up to 16 m.p.h., up 25% grades. Never tire or slow down. Rugged. Reliable.



Maximum efficiency is achieved with Whiteman Vibrators. Built for outstanding performance and durability to highest Whiteman standards. Three models, gas and electric, for every requirement.



Only half the manpower is required to operate a Whiteman Screeding Machine. Does a better job, too. Vibrates throughout entire area, compacts slab, screeds to perfect level. Width adjustable 3 to 24 ft.



The work of six men with hand trowels can be done with just one Whiteman Finishing Machine . . . and far better. Produces an extremely smooth, level slab. Perfected over 17 years. 11 models for every requirement.

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TRUCK MIXERS



POWER BUGGIES



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THE LEADER
IN CONCRETE
EQUIPMENT

WHITEMAN MANUFACTURING CO. DEPT. CE
13820 Pierce St., Pacoima, Calif.

Please send prices, catalogs and name of distributor for
☐ Power Buggies ☐ Screeding Machines ☐ Vibrators
☐ Floating-Finishing Machines ☐ Truck Mixers.

Name _____

Firm _____

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The Carr subgrade planer pulled by the Koehring 34-E Twinbatch paver cuts the base to true line and grade. The planer's long tracks ride in the path prepared for them, providing stability for the carrier and making the grade accurate.

(Continued from preceding page)

and puddle the concrete, leaving the surface ready for the finishing operations. A stationary strikeoff shoe trowels the surface. Built in one section, this shoe is readily adjustable by the operator to compensate for changes in crown or superelevation.

The final unit of the paver is a power belting device which, like the other units, is driven by its own electric motor.

On this job, a 20-foot section of rigid form was trailed behind the

paver. The two side forms were held together by a pair of trusses spanning the width of the roadway. In this 20-foot length, workmen using long-handle straight-edges work out any longitudinal waves and correct any surface or edge defects. A burlap drag attached to the rear of the forms gives the final finish.

Using hand sprays with power-operated Hudson pumps, workmen sprayed the surface of the slab with Carter-Waters Hunt process curing compound in the final step of the fast-moving operation.

Batch plant

Aggregates and cement for the concrete were dry batched from a plant set up at a rail siding in Paton. Sand and coarse aggregate were delivered by truck from local sources and were batched from a 2-compartment 75-ton Johnson bin fed by a crane with a Johnson 1-yard clamshell bucket.

The cement was batched directly from rail cars to the batch trucks by a Johnson transfer plant. The fleet of batch trucks included seven International R-170 tandem-axle units that hauled four 37.4-cubic-foot batches per load. The rest of the fleet, which at times numbered as many as 16 trucks, had the smaller two-batch bodies. Because of the narrow roadway, the batch trucks always had to turn around in a driveway and back up the grade to the paver. In several cases, this meant backing as much as a quarter of a mile or more.

Personnel

While the dry-batching operation required about a usual complement of workmen, the entire finishing operation needed only about nine or ten workmen. The form-setting crew was completely eliminated.

Supervising the operations for Hallett Construction Co. was superintendent R. C. McConnell. He was assisted by plant foreman Bob Cattanack, grade foreman Hal Green, and concrete foreman Kermit Schutz. The county engineer of Green County is C. Arthur Elliott.

THE END

Case history

Tractor-shovel slashes cost of razing building

Tractor-shovels are taking to the air—literally—in a new application that is trimming time and costs on demolition jobs.

Lipsett, Inc., New York, N. Y., is one of the firms achieving a speedup in razing the old Marguery apartment-hotel at 270 Park Avenue, New York City, by having a Hough Payloader clear debris from upper floors and dump it to chutes leading down to trucks at street level. Demolition work is expected to be completed in August, when work will get under way

"Our 75-ton Southwest Pneumatic Compaction Roller averages 10,000 cu. yds. of fill compaction per day,"

reports

OBERG CONSTRUCTION CO.
Inglewood, California

The \$7.2 million Ventura-San Diego Freeway interchange in California is a big earthmoving job in any league. It's a two year project—scheduled for completion in 1959—involving 4.3 miles of road construction where the two freeways intersect near Van Nuys, California. In addition to roadways, the project includes 10 concrete bridges, an equestrian underpass, and a pedestrian overpass. Some 2.5 million yards of earth fill will have been compacted when the job is completed—and that's a lot of compaction on any highway job.

Compaction problems on the Ventura-San Diego Freeway job aren't easy. 1.1 million yards of the material compacted comes from the balanced cut and fill on the job site and a borrow pit in the Sepulveda Dam basin, and the remaining 1.4 million yards is obtained from a borrow pit miles from the project site and trucked in. That means a variety of types of material, varying moisture content, and a wide disparity in soil structure.



To Oberg Construction Co., prime contractors on the job, these compaction problems are not new. The firm knows compaction methods and compaction equipment. The contractors selected a Southwest 75-ton Pneumatic Multiple-Box Compaction Roller as the basic compaction tool for the work. To lend support, three Southwest Sheepfoot Double-Drum Tamping Rollers were added to complete the compaction machinery spread. The multiple-box pneumatic compaction roller is pulled by an integrally attached Caterpillar DW21 single axle tractor, and the sheepfoot tampers by Caterpillar D8 Track-Type Tractors.

While the Southwest 75-ton Multiple-Box Pneumatic Roller is utilized mainly for compaction of long fills, it also works on area compaction near bridge approaches on the job. Oberg Construction Co. personnel describe the operation in their own words as follows: "We purchased the Southwest 75-ton Pneumatic Roller and Cat DW21 Tractor combination because it is fast, agile and efficient. We are taking full advantage of these features

to step up our production. Working with only one of our Southwest Sheepfoot Tampers, the 75-ton pneumatic roller is averaging 10,000 cubic yards of fill compaction per day—easily handling to 90% compaction specification all the material delivered by a fleet of eight Cat DW21 Tractor-Scrapers. On the longer fills we find that the Southwest Pneumatic compacts higher fills in fewer passes. To take full advantage of the pneumatic's speed and efficiency we disc, roll and sprinkle the long fills, facilitating rapid compaction by the hefty Southwest tool," they conclude.

Southwest Heavy Duty, Multiple-Box Type Pneumatic Compaction Rollers range in size from 10 to 100 tons. Turning radii, with single-axle tractor, range from only 8'9" to 15'. The tractor and compactor deliver constant load pressure regardless of contour—due to the extra-oscillating freedom of the Southwest individually mounted wheels and weight boxes. A full 12" of vertical oscillation of the weight boxes and wheels is possible in all models, eliminating load bridging or shifting, and assuring constant compaction weight on each wheel. Compaction of lifts up to 24" are possible with Southwest Pneumatic Multiple-Box Compaction Rollers—higher lifts in fewer passes.

**COMPACTION IS BEST
WHEN YOU USE
SOUTHWEST**

Call or Write for information.



Pneumatic Compaction Rollers • Sheepfoot Rollers • Rippers • Sprinkler Tanks

Southwest

PRODUCTS ARE SOLD AND SERVICED BY YOUR CATERPILLAR® DEALER

CONSTRUCTION MACHINERY DIVISION

Southwest Welding & Manufacturing Co.

ALHAMBRA, CALIFORNIA

For more facts, use Request Card at page 18 and circle No. 362



on the new Union & Carbide Corp. 52-story home office.

Before chancing the use of the 2-ton Payloader on the building, which has a live load capacity of 140 pounds per square foot, Lipsett wrecked the top two floors of the structure's 12-story east wing.

As efficient as the job of the Payloader was the job of getting the rig to the tenth floor. The lift was made in about three minutes by a cable pulley rig, located in the inner court, powered by a 55-hp gasoline engine. Almost another 15 minutes were required to work the Payloader between scaffolds and structural steelwork and land it in the tenth floor.

Crews with jackhammers supplied with air by two Ingersoll-Rand 600-cfm Gyro-Flo compressors located on the ground are breaking up the brick and steel structure. As these gradually reduce a floor to debris, the Hough Payloader scoops up broken material with its 3/4-yard bucket and dumps it into one of the six chutes spotted around the building. On an average, the fleet of 10 to 12 haul trucks cart 80 loads of material from the building daily.

For further information on these Payloaders write to the Frank G. Hough Co., Dept. C&E, 822 Seventh Ave., Libertyville, Ill.

Circle No. 265.

Public relations manager for AGC killed in crash

William E. Woodruff, manager of public relations for the Associated General Contractors of America and managing editor of *The Constructor*, official publication of the AGC, died early last month from injuries suffered in an automobile accident.

Mr. Woodruff had been public relations manager for the AGC since 1939. Prior to that he had been a reporter for the old *Washington Herald* and the *Washington Post*.

He was a member of the National Press Club, and Public Relations Society of America.

Highway administration books topic of HRB report

A bibliography of "Highway Administration" is now available from the Highway Research Board.

The topics covered are administration, inter-governmental relations, public relations, highway laws, fiscal control, and highway planning.

The \$1 book may be purchased from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C.

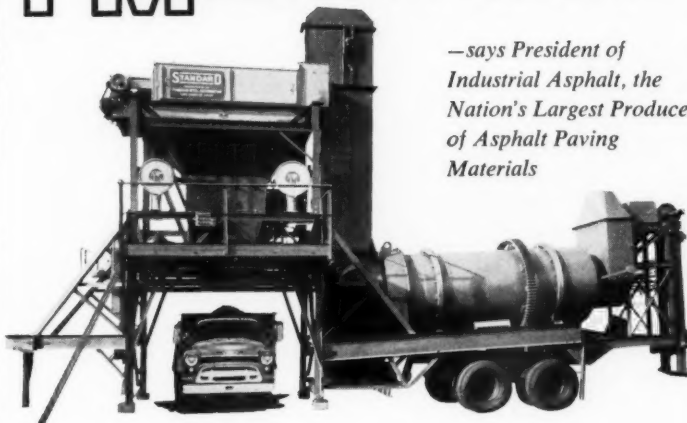
JUNE, 1957

Case history: Workmen place an air-driven McKiernan-Terry 9B3 double-acting pile hammer in position for an unusually precise job. The interlocking steel sheet pile will form an open caisson to be used in the New York City Transit Authority modernization program. Driving within 2 feet of existing buildings, past old steel sheeting, and through heavy timbers, the hammer had to place the sheeting on the roof of an existing subway manhole without cracking it. The work called for a heavy-duty hammer with egg-shell delicacy of control. Tully & Di Napoli, Inc., Flushing, N. Y., contractor, found the M-K hammer just the ticket for this delicate operation. McKiernan-Terry Corp., Pile Hammer Division, Dept. C&E, 100 Richards Ave., Dover, N. J. Circle No. 97.



As fast as jackhammer crews break up the concrete of the Marguery apartment hotel in New York, this Hough Payloader with 3/4-yard bucket scoops it up and sends it down chutes to trucks waiting at street level. The rig is speeding this demolition job, with a resultant saving to the contractor.

"HERE'S WHY OUR 23RD STANDARD ASPHALT PLANT IS A NEW 2000 POUND TM Mobile Mixer"



—says President of
Industrial Asphalt, the
Nation's Largest Producer
of Asphalt Paving
Materials

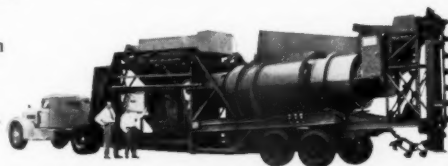
"STANDARD'S TM Mobile Mixer gives us easy hook-up... erects quickly, by itself... is always dependable... has the same strength and guts as Standard's larger R-M Asphalt Plants.

"TM means Time & Money for us! Profits are increased by getting from job-to-job FASTER—we get in MORE jobs during the year! Take Standard's TM Mobile Mixer down and move it in one day... the following morning, it's at the next job!

"The new 2000 pound TM Mobile Mixer is a honey for difficult terrain and hard-to-reach areas. With one-man push-button operation, we easily get 60 to 80 tons of top quality asphalt per hour."

Get the complete TM Mobile Mixer PROFIT STORY NOW! Write today for Bulletin 563.

The TM Mobile Mixer is shown here in transit position, ready to move on to the next job!



STANDARD STEEL CORPORATION



Decatur 7, Illinois
General Offices and Factory, 5007 Boyle Avenue, Los Angeles 58, Calif.

LEADER WORKS

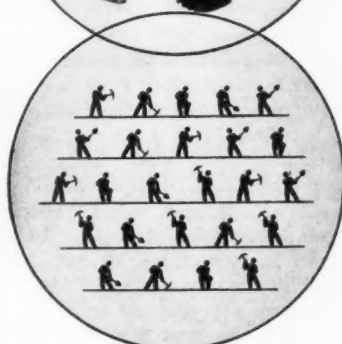
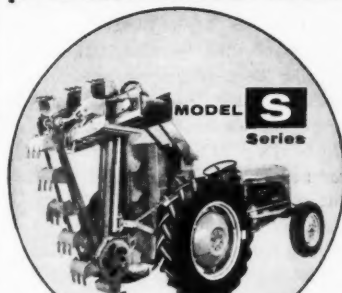
Midwest Offices and Factory
Eastern Sales Office, 15 Park Row, New York 38, N. Y.

ROTARY DRYERS • KILNS • COOLERS • ASPHALT PLANTS

For more facts, use Request Card at page 18 and circle No. 363

The Everett[®] Trencher

equals the work of 25
pick and shovel men!



Engineered and designed for the great
new FORD and FERGUSON (as well as
MASSEY-HARRIS MH-50) TRACTORS

The Everett Trencher cuts clean straight trenches up to 42" deep, 12" to 18" in width. It operates from the power take-off of the tractor—raised and lowered by built-in hydraulic system. Quickly installed. A "V" belt safety slip feature is built into the drive of the trencher which automatically stops the bucket line and prevents damage when obstructions are encountered.

Write today about another

great **EFC** product

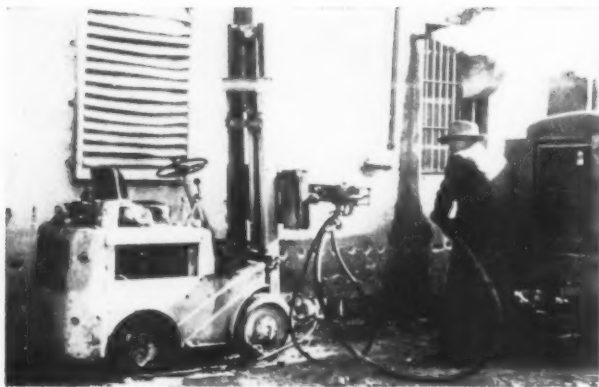
THE EVERETT TRENCHER **MODEL 60**

DIGS TRENCHES UP TO 5' DEEP AT
LESS THAN HALF THE COST OF
COMPARABLE MACHINERY.

The Model 60 will do a big digging job at a sensible price. Hydraulically operated it will dig close to buildings, pipes, etc.

EARTH EQUIPMENT CORP.,
2036 Sacramento St., Los Angeles 21, Calif.
Please send full information on:
☐ Model S Series Everett Trencher
☐ Model 60 Everett Trencher
NAME _____
COMPANY _____
ADDRESS _____
CITY _____ ZONE _____ STATE _____

For more facts, use coupon or circle No. 501



Case history: A fork truck provides an inexpensive and maneuverable drill setup in removal of the Pulaski County, Ark., jail from the path of the new Little Rock superhighway. Mural & Son, Cleveland contractor, uses a Clark 1,000-pound fork truck as a solid but mobile support for a pneumatic drill. The technique for moving the 4,000-ton jail to its new site involves drilling holes through the reinforced concrete foundation to admit a load-carrying grid of I-beams. The grid will rest on rollers and tracks during moving. The Clark fork truck provides fast elevation for drilling grid holes and easy moving of the rig along the foundation lines. For further information on these fork trucks, write to Clark Equipment Co., Industrial Truck Division, Dept. C&E, Battle Creek, Mich. **Circle No. 234.**

Case History

Inexpensive electrode saves \$1,600 casting

Abnormal conditions subjecting equipment to tremendous shock and strain often play havoc with metal castings. Such often happens to earthmoving equipment—and happened in this case to a crawler tractor that arrived for repairs and reconditioning at the Shepherd Machinery Co.'s shop in Los Angeles.

The casting was the final drive housing. It was cracked and broken. Cost for a new replacement would have been \$1,600 plus freight.

For some time, Shepherd Machinery had been brazing broken iron castings. This necessitated complete disassembly and preheating, which along with rising labor costs was narrowing the margin of profit. The firm, searching for a better and less costly way, decided to try arc welding, and had some unfortunate experiences with their early trials.

These were the circumstances when they were ready to tackle the final drive housing. They decided to seek technical help, and enlisted the aid of an All-State Welding Alloys dealer. Using \$11.35 worth of fully-machinable nickel-core electrode, they were able to weld the broken casting at a minimum materials cost.

The results were excellent. The tractor has been in use ever since.

For further information on these nickel-core electrodes and their use, write to the All-State Welding Alloys Co., Inc., Dept. C&E, 249-55 Ferris Ave., White Plains, N. Y.

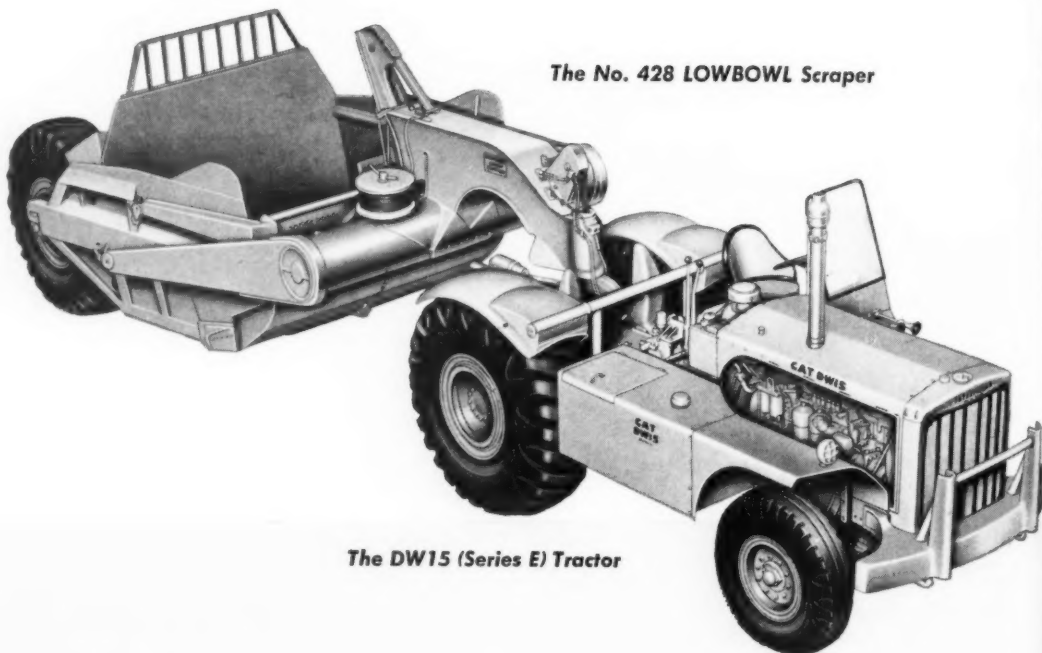
Circle No. 98.



Welding under way on the left side of the final drive housing on a crawler tractor. The low-amperage nickel-core electrode permitted welding in place without preheating.

CATERPILLAR ANNOUNCES

NEW DW15 (SERIES E) AND NEW No. 428 LOWBOWL SCRAPER



The No. 428 LOWBOWL Scraper

The DW15 (Series E) Tractor

Here's a new Cat team loaded with features that add up to one thing—A HIGHER PRODUCTION RETURN ON YOUR INVESTMENT. See your Caterpillar Dealer for details on this great team's performance.

GET THE STORY IN BRIEF ON THE OPPOSITE PAGE ►



Dual-purpose Superior power trowels are used to finish this concrete slab roof on a Rivera, Calif., plant.

Case history

Dual-purpose finishers speed roof slab work

Concrete-finishing operations on a 80,000-square-foot slab roof for the Kaynar Mfg. Co.'s new plant at Rivera, Calif., were speeded up through the use of Superior power trowels, manufactured by the Superior Cement Tool Corp.

Brunzell Construction Co., Inc., Culver City, Calif., was the contractor on the job. Superior finishing machines used on the job demonstrated their ability to float and trowel concrete in one non-stop operation. The machines have four dual-purpose

blades and feature a conveniently located hand crank for adjusting blade pitch during operation.

The units also have sealed, life-time-lubricated gear boxes and stationary guard rings which permit close-to-wall operation.

For further information about Superior power trowels write to the Superior Cement Tool Corp., Dept. C&E, located at 11616 Wright Road, Lynwood, Calif.

Circle No. 34.

A GREAT TEAM: The performance of the DW15 (Series E) Tractor and No. 428 Scraper can be summed up simply: **bigger loads—faster.**



FACTS ABOUT THE DW15 (SERIES E) TRACTOR

Around the world, the DW15 has proved that it can move material faster and more profitably than competitive machines in its class. Now there's a new DW15 (Series E) to give you even higher production. This is the story:

ENGINE: A new Caterpillar D326 Engine, designed especially for the DW15 (Series E), develops 200 HP (maximum output capacity).

And Caterpillar research has produced a 23% torque rise in this new engine! This means that high tractor rimpull is maintained through a wide range of travel speeds in each gear, and the need for gear changing is decreased. In fourth gear, for example, over 3,000 pounds of rimpull are delivered at travel speeds from 9 MPH all the way to 18 MPH. A new engine, yes—but with these traditional Caterpillar advantages: uses inexpensive No. 2 furnace oil without fouling; needs no fuel system adjustments; requires no cleaning of fuel injection valves.

TRAVEL SPEED: The DW15 (Series E) offers ten speed selections, from 2.7 to 37.2 MPH. But, more important, it provides four-wheeled sure-footedness—the ability to use the speed on the job. Operators ride with more comfort, feel greater stability. They travel faster, and in safety.

MANEUVERABILITY: Four-wheeled stability means faster cycle time because the DW15 (Series E) can make short radius turns at higher speeds. It can turn without stopping inside a 35-foot diameter and in a smaller area through use of a turn-back-turn maneuver.

VERSATILITY: The DW15 (Series E) provides versatility that far surpasses similar sized two-wheeled machines. It can be unhitched from its scraper and

used as an independent unit to tow compactors, water wagons or other units, and it can be teamed with the Athey PR15 Wagon for rock hauling work.

FACTS ABOUT THE No. 428 LOWBOWL SCRAPER

CAPACITY: Struck—13 cu. yd.; heaped—18 cu. yd.

ADVANCED DESIGN: There is more to Caterpillar's exclusive LOWBOWL design than a low bowl profile. Width and length proportions are designed to give maximum loading efficiency. And every component—particularly the apron, ejector, cutting edge—is likewise designed to do its part in achieving capacity loads.

LOADABILITY: The final result of this careful engineering is this: bigger loads—faster. LOWBOWL design gives the new Caterpillar No. 428 Scraper a faster loading rate because incoming material meets less material resistance and less friction from the load already in the bowl. While other scrapers are still in the cut struggling for the last few yards of their load, the new Cat units are on their way to the fill—with big pay loads!

NEW FEATURES: Outstanding new features of the No. 428 include: increased ground clearance—for high-speed travel in rough going; increased apron lift—for faster ejection of any material; large area pushblock—for better pusher contact.

NEW TIRES FOR THE DW15-No. 428

Both the CAT* DW15 (Series E) Tractor and No. 428 Scraper feature 26.5-25 wide-section tubeless tires—the product of extensive co-operative research by Caterpillar Tractor Co. and leading tire manufacturers. Tubeless tires offer load-carrying capacity comparable to conventional tires at a reduced inflation pressure. This gives better flotation and traction while decreasing rolling resistance. The wider tire treads take a "grouser like" bite, making more efficient use of engine horsepower. And tubeless tires eliminate 80% of the down time caused by tire failure.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

ONE GOAL: To concentrate our capabilities, resources and experience on the design, manufacture, distribution and service of job-tested heavy equipment.

For more facts, use Request Card at page 18 and circle No. 364

Case history

Slope device cuts time, cost of grading work

The Koss Construction Co., Des Moines, Iowa, reports that it has effected sizable savings in its grading operations by a slope-checking device mounted on its grading machines.

The Slope-Meter, a product of Slope-Meter Co., features an indicator that automatically shows the exact grade or slope on which a machine is working. By watching this instrument, the operator is able to construct and check variable slopes while the machine is in motion. The machine's accuracy is sufficient to eliminate hand-checking altogether.

Slopes are made to specifications in less time, the contractor reports, and machine time required to make perfect highway crowns is reduced.

For further information on this instrument, write to Slope-Meter Co., Dept. C&E, Box 268-C, Excelsior, Minn.

Circle No. 184.

Case history

Detachable, reusable hose fittings cut repair time

Equipment downtime due to defective and worn out fluid-carrying lines has been almost eliminated through use of Aeroquip flexible hose assemblies, a West Coast construction maintenance superintendent reports.

The hose, suitable for air, water, lube oil, hydraulic, and fuel applications, is used primarily for hydraulic line repair on loaders and dump hoist cylinders. When field repairs are needed, the waiting time for parts is eliminated due to the adaptability of Aeroquip bulk hose and fittings.

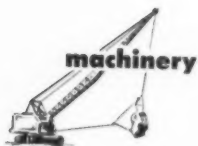
Only fittings are required to make an installation on practically any machine, the report states, whether or not it was originally supplied with Aeroquip.

Another feature remarked upon is the relative ease with which repairs are made. Only simple hand tools are required.

For further information about Aeroquip bulk hose and fittings, write to Aeroquip Corp., Dept. C&E, 303 S. East Ave., Jackson, Mich.

Circle No. 203.

For more data on any item, circle indicated number on card at page 18.



Road mixer spurs highway relocation

A fast relocation job on U. S. 70 in Arizona was paced by a rig that dispersed 1½ per cent portland cement with subbase material, without streaking, to reduce the plasticity index of the material to zero. The key unit in an equipment train that consisted of a Caterpillar No. 12 motor grader, watering truck, Hercules spreader, Huber steel wheel roller, and a pneumatic roller, was a Seaman-Andwall Trav-L-Plant.

The job, contracted to W. J. Henson of Prescott, Ariz., was a \$2,500-per-mile change order that included production and installation of select material, aggregate base course, mineral aggregates, plant-mix paving, and a seal coat of emulsion with Type B cover rock, together with cleanup work. The Arizona State Highway Department supervised all work on the 2-lane highway that runs between Globe and Safford.

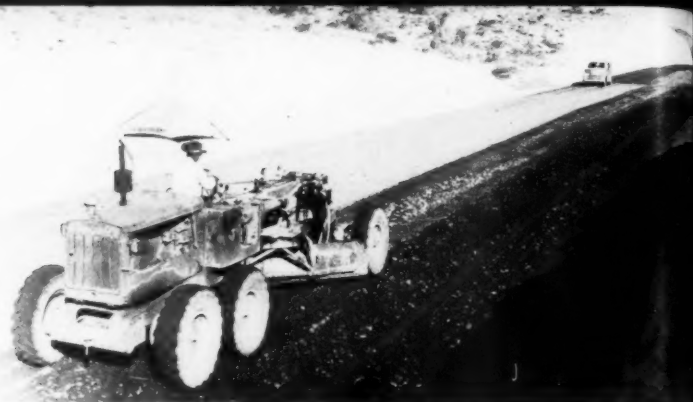
Test sections, gradations

The subbase contract called for 3 to 10 per cent of the 4½ inches of select pit-run granular material to pass the No. 200 sieve and have a PI range of zero to five. Specifications for the mineral aggregate in the plant mix and the aggregate base course were the same. Before the 3 to 4½ inches of aggregate base course could be placed, a gradation of 100 per cent had to pass a 1-inch mesh; 50 to 75 per cent, for the No. 4 mesh; and 3 to 10 per cent passing the No. 200. The PI range for this material was also zero to five.

A 14,700-foot test section, containing 4½-inch select lower material and an upper 3-inch aggregate base, was treated with 1½ per cent cement. Following this is an untreated 1,800-foot long section. Adjoining the untreated section is a 35,875-foot-long strip containing untreated select material in the lower portion and 1½ per cent cement in the upper aggregate base course.

The select material for the 14,700-foot test section was hauled in by dump trucks, laid in a 4½-inch thickness, and, as it was spread by Caterpillar No. 12 blades, watered by 4,000-gallon tanks mounted on White trucks. This completed, another 4½-inch layer of select material to be cement treated was placed in the same manner as the first. Equipment worked on only one side of the roadway at a time.

As soon as the upper 4½-inch layer of material had been placed, it was scarified by a Caterpillar No. 12 motor grader to make the work easier



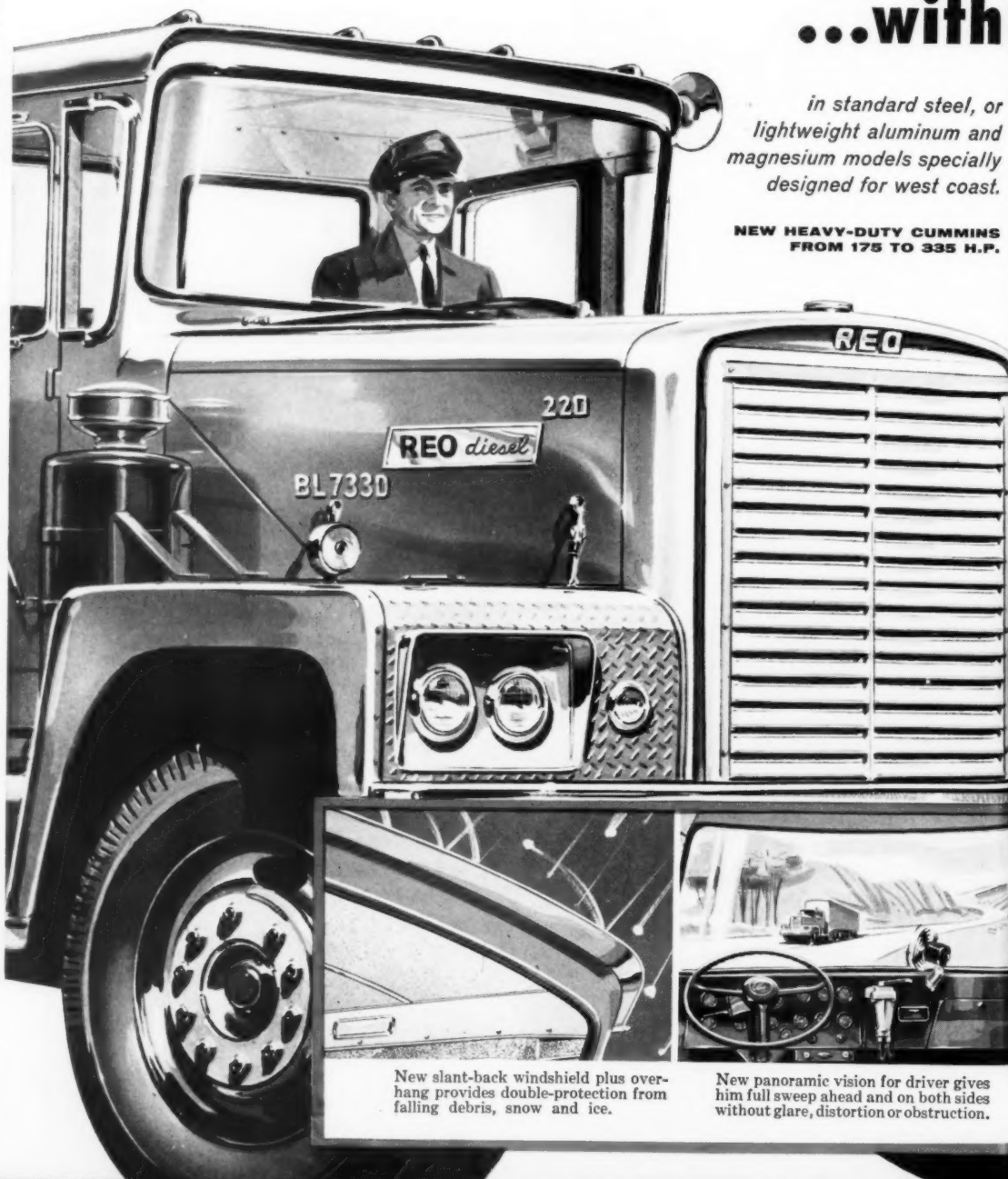
A Caterpillar No. 12 motor grader rips up the upper 4½-inch layer of select material to make the work easier during the cement mixing operation and to allow for additional wetting.

NEW REO

...with rev

in standard steel, or lightweight aluminum and magnesium models specially designed for west coast.

NEW HEAVY-DUTY CUMMINS FROM 175 TO 335 H.P.



New slant-back windshield plus overhang provides double-protection from falling debris, snow and ice.

New panoramic vision for driver gives him full sweep ahead and on both sides without glare, distortion or obstruction.

The select base material is watered down by a 4,000-gallon tank mounted on a White truck.

The Hercules spreader, right, attached to the rear of a transport truck, places a 7-foot wide cement strip on one lane of the highway. The Trav-L-Plant finishes one-pass mixing of base already containing the cement.



during the cement mixing operation and to allow for any additional wetting that might be required.

Transport trucks and trailers from Tucson hauled in the bulk cement between 5 and 7 a.m., tying in with the 7 a.m. start of the day shift. To eliminate transferring cement to field dump trucks, the contractor attached a Hercules cement spreader to the rear of the transport trucks.

The Hercules spreader, placing a 7-foot-wide cement strip, was followed by a Seaman-Andwall Trav-L-Plant that did one-pass mixing, operating in low gear at speeds up to 80 fpm on the select material. With the aid of its rotor and mixing tines, the Trav-L-Plant moved the cement down through to the bottom of the lift and dispersed it laterally. In many places, the select pit-run material contained particles as large as 4 inches, and this was handled in the plant's mixing chamber. Repeated field inspections of the mix showed a good dispersion of the cement. The fine and coarse particles were equalized in the subbase, creating a uniform product.

Just behind the Trav-L-Plant, a Huber 6-ton steel-wheel tandem roller delivered the initial compaction in the lift. After a heavy rolling with this machine, the material was watered again by tank sprinkler trucks. A self-propelled pneumatic roller followed the sprinkler to knead down the surface tightly.

The largest size particle on the aggregate base course was one inch. In order to cover the 37½-foot wide roadway, the Trav-L-Plant made five passes, mixing 7½ feet per pass.

After all cement treating had been finished, the surface was treated with a penetration coat of MC-2 or MC-3 asphalt. Later, a 2-inch-thick surface was put down in one pass. This paving, made with SC-6 asphalt, completed the work. The use of the in-line train method enabled the contractor to finish a 4,000-foot long, 37½-foot wide pavement each day.

Personnel

General superintendent for the W. J. Henson firm was C. L. Cleveland. Representing the Arizona State Highway Department was Oscar Lyons, area engineer; Ray Copple, the department's chief project supervisor; and Phil Bradbury, field materials engineer.

Technical help and supervision was furnished by the Portland Cement Association, through John Robinson, the Phoenix representative. THE END

DIESELS

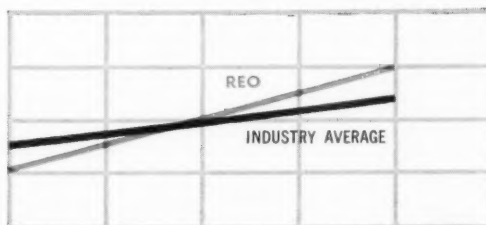
With revolutionary Reo Driver's Cab

Reo's New B Series Diesels are brand new. They are the result of extensive research and testing to find the perfect cab for all drivers . . . in all operations . . . and under all conditions. They introduce a new concept in driver comfort, convenience and safety—from the Bostrom "Level Ride" seating to the "Panoramic Vision" slopeback windshield . . . from the flat floor and living room spaciousness to the visibility of instruments and convenience of controls.

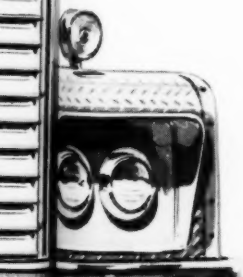
Both four and six wheel tractors and trucks come in all steel or weight reduced aluminum and magnesium. These trucks are especially engineered for economical "Big Load" operations—long-distance highway hauling or tough off-highway service.

Over 8,000 combinations are possible in custom engineering a model to your specific operating requirements...using only proven major components from a wide selection.

"Heavy" trend is to Reo! Reo sales gain in 26,000 lb. and over GVW class exceeds that of the industry during last 2 years.



REO MOTORS, INC., LANSING 20, MICHIGAN • TORONTO, ONTARIO



FRONT AXLE FORWARD position for states where total combination weights are controlled by bridge formulas. Single or tandem rear axles.



FRONT AXLE REAR position for states where maximum front axle loading is desired and bridge formulas are not a factor. Single or tandem rear axles.

New "living room" comfort for driver. Full leg room. No "dog house". Bostrom "Level Ride 80" driver's seat.

New roominess under hood for ease in servicing engine. Husky "Catwalk" fenders, with "diamond" safety treads.



Horn Construction Co. uses a crane with 60-foot boom to handle its McKiernan-Terry C-5 pile hammer on this project. Air for the hammer is furnished by an Ingersoll-Rand compressor on a platform at the rear of the crane.

Case history

New hammer speeds work on bridge approach piles

Using the new McKiernan-Terry C-5 pile hammer, Horn Construction Co., Inc., Merrick, N. Y., has increased its daily per-linear-foot production by at least 35 per cent. This has been due to the speed and operating efficiency of the hammer—first introduced at the January Road Show in Chicago—and the almost negligible amount of maintenance it requires, the contractor reports.

Horn Construction, handling a subcontract for the driving of all the foundation piles on the new Brooklyn-Queens expressway connection to the Brooklyn Bridge in New York City, has been averaging over 1,000 linear feet of steel H-piling per day with the new C-5. Prior to this 750 linear feet per day was considered good production.

Driving of the 60-foot-long 12-inch H-piles to a minimum bearing of 40 tons is being handled by the McKiernan-Terry C-5 hammer riding in 80-foot leads. The leads are mounted on a Bucyrus-Erie 54-B crane, equipped with a 60-foot boom, which carries an Ingersoll-Rand 600-cfm air compressor on a rear platform.

The new hammer, delivering 110 blows per minute with an energy of 16,000 foot-pounds, has an extremely low striking velocity which results in little or no pile head deformation, always a problem when driving thin-wall pipe piles. Upstroke hammer jump is also reduced due to the utilization of all available energy of the motive fluid, whether it be air or steam, which is exhausted at 17 psi.

Lubrication of the movable parts of the hammer, which are all internal and very few, is handled automatically through the air or steam line, eliminating the necessity for operators to stop the hammer to fill any on-the-hammer lubricant reservoirs.

For further information on this pile hammer write to the McKiernan-Terry Co., Pile Hammer Div., Dept. C&E, 100 Richards Ave., Dover, N. J.

Circle No. 232.

Case history

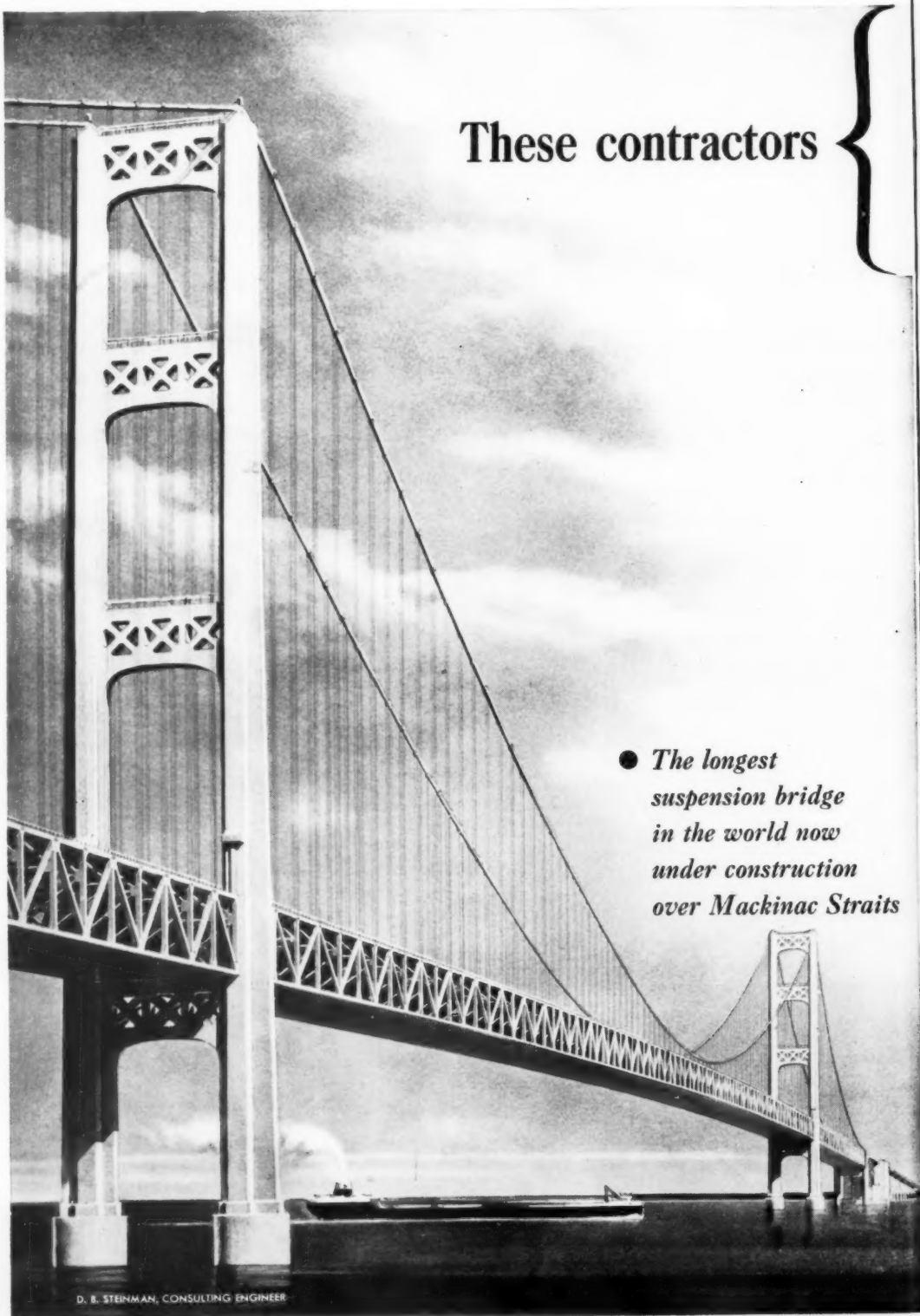
Half-size asphalt paver is highly maneuverable

Operating within the close confines of two elementary school playground areas, a Chicago paving contractor was able to cut his crew's working time in half recently through the use of a new half-size black top paver.

Ordinarily a two-day job, the playground work was completed in a single day as the Blaw-Knox Model PF-45 paver laid nearly 200 tons of 2-inch thick bituminous concrete over 2,400 square yards at two locations three miles apart. The paver also suffered a brick-paved street, 40 feet wide and 600 feet long, the next day.

John F. Dillon, vice president of John Dillon Co., Chicago, and supervisor of the three jobs, credited the speed-up in completed work to the new paver. "It's maneuverable, has good travel speed, and the floating action of the screed helps quite a bit in maintaining the proper thickness of the asphalt covering," he said. "We were working in areas requiring short passes, and the paver was able to move without delay."

Mr. Dillon also cited the fact that the paver is able to move under its own power from one working area to



These contractors

● The longest suspension bridge in the world now under construction over Mackinac Straits

D. E. STEINMAN, CONSULTING ENGINEER

CONTRACTORS AND ENGINEERS



Blaw-Knox's new half-size blacktop paver maneuvers in the confined area of a school playground to lay a 2-inch-thick asphalt pavement.

another and does not have to be unloaded from a truck or trailer.

"After finishing up at one school," he said, "we drove the paver 3½ miles through southwest Chicago streets to the other school in 25 minutes. We were set up to pave at the second by the time rolling was done at the first."

Both playgrounds are fenced and had been graded and rolled prior to the asphalt application. Eighty tons of I-11 bituminous concrete was used to pave the first playground; 110 tons to pave the second.

For further information on this new paver write to the Construction Equipment Division, Blaw-Knox Co., Dept. C&E, 40 Charleston Ave., Mattoon, Ill.

Circle No. 37.

Case history

Clutch assembly speeds earth-borer operation

When Raber & Kief, Seattle, Wash., contractor, subcontracted for some 900 piling holes on a U. S. Army Corps of Engineers project, the firm faced two difficult conditions: the job site was Kotzebue, Alaska, about 50 miles inside the Arctic Circle; and the work had to be done during the cold season.

Realizing the problems involved, project superintendent Arthur L. Nicholson recommended purchase of a Hugh B. Williams Model LDH-40 earth-boring machine which is made in Dallas, Texas.

In a little over 60 days the machine had completed 858 holes averaging 20 feet in depth and 24 inches in diameter—despite subzero temperatures and ground that was virtually solid ice, or permafrost.

Partial credit for this unusual performance record is attributed to the earth-borer's components, which included four Twin Disc Model E-114 clutches and one B-114 power take-off.

The Model E-114 clutches are used to raise and lower the machine's kelly bar; for normal drilling rotation; and for changing to a faster auger speed so that dirt is thrown off after the auger is raised.

For further information on these clutch assemblies write to the Twin Disc Clutch Co., Dept. C&E, Racine, Wis.

Circle No. 233.

Case history

Metal laths cut costs, give added space

A report on the use of 2-inch metal lath and plaster partitions in the new Statler-Hilton Hotel in Dallas indicates not only a savings in construction costs, but a gain of valuable added floor space as well.

When the linear feet of partition construction was tabulated, it was found that 744 square feet of space was gained on each floor.

The partition, a vertical slab rein-



forced two ways with expanded steel and ¾-inch channels, is described as lightweight, yet strong, and easily constructed.

For further information about these metal laths, write to Metal Lath Manufacturers Association, Dept. C&E, Engineers Bldg., Cleveland 14, Ohio.

Circle No. 198.

Merritt-Chapman & Scott Corporation and American Bridge Division of U. S. Steel Corporation

Use Shell Lubricants in the construction equipment on Mackinac Bridge project

Today's engineering knowledge and modern construction equipment are making the mighty Mackinac Bridge a reality. This equipment requires oils and greases which will remain stable and give adequate lubrication at extreme temperature ranges. To keep their heavy-duty machines operating at maximum efficiency with a minimum of down time, both companies, Merritt-Chapman & Scott Corporation and American Bridge, chose Shell Lubricants and Fuels.

The Mackinac Bridge project is just one of the many construction operations where equipment was lubricated and protected by Shell products. Wherever heavy-duty equipment operates, Shell Lubricants and Fuels are being used to keep machinery in top operating condition and hold maintenance costs down. Perhaps it will pay you to investigate the savings that can be realized through the use of Shell Industrial Lubricants and Fuels.

SHELL OIL COMPANY SUPPLIES:

Gasoline	Solvents
Fuel Oil	Motor Oils
Diesel Fuel	Anti-Freeze
Kerosene	Greases
Industrial Lubricants	Outboard Motor Oil
and many other fuels and lubricants	



American Bridge Division of U. S. Steel Corporation has strung a total of 12,500 tons of cable as part of the 66,500-ton superstructure.



One of the 34 piers of the bridge substructure built by Merritt-Chapman & Scott Corporation

SHELL OIL COMPANY

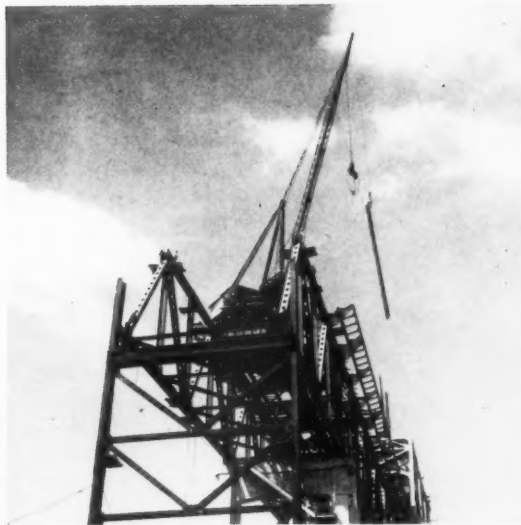
50 West 50th Street, New York 20, N. Y. • 100 Bush Street, San Francisco 6, Calif.



For more facts, use Request Card at page 18 and circle No. 366



◀ This Manitowoc 3900 with 100-foot boom and 20-foot jib lifts a steel member from a stockpile and prepares to load it to a trailer.



The 25-ton traveler hoists steel to the crews. The falsework bent consists of two spliced I-beam posts supported by an I-beam grillage and floor beams to be used in the bridge. Built-up box girders form the cross bracing.

River falsework bents

The river bents were founded on 10-inch H-beam piles driven through a steel cage. An I-beam grillage, and floor beams, later to be used in the bridge, formed the support for the two spliced I-beam posts that rose to support the bottom chords. Built-up box girders formed the cross bracing between the steel posts. Two hydraulic jacks under each leg permitted the bent to be adjusted to the exact height required. The land falsework bents, of similar construction, rested on spread timber footings.

Steel handling

Steel members for the anchor arm between piers 1 and 2 arrived in barges from Rankin, Pa., where the built-up members were fabricated. Individual steel members for the section of the span that was above water were lifted directly from the barge and placed in position by a traveler. The two-boom tower traveler had a 115-ton stiffleg derrick on the front for erection of the main members and a 25-ton stiffleg derrick in the back for bracing and miscellaneous work. The heaviest member the traveler handled was a top chord about 100 feet long and weighing 92 tons.

Steel for the section of the span between piers 1 and 2 that was above the Thalia Street Wharf was lifted from the barge by a 25-ton stiffleg derrick with an 80-foot boom positioned at the edge of the wharf. The derrick placed the steel on a dolly that ran on tracks along the wharf to a position where the steel could be picked up by the traveler.

Erection pins and bolts held the members in place until the riveting was done. Riveting hammers, powered by air compressors located on the ground, made all of the connections.

Algiers anchor arm

As the superstructure built out towards pier 2 on the New Orleans side, work was also progressing on the anchor arm on the opposite side of the river.

Steel for this span arrived by rail on tracks that ran between piers 3 and 4. The steel was stockpiled at a point near the bridge. When individual members were needed, a Mani-

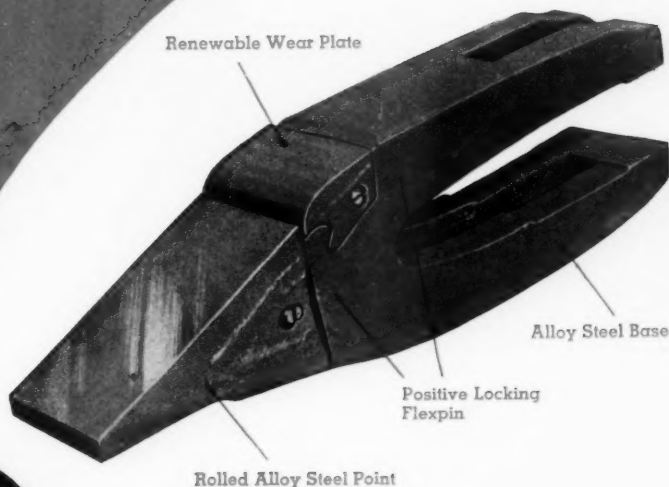
(Continued on following page)

H&L

Take advantage of
EXPERIENCE specializing exclusively
in the manufacture of

Teeth that really dig

There is no
substitute for
**FORGED
ALLOY STEEL**



Whistler type shanks for 8 or 10 yd. shovels with renewable wear plate and forged tooth point. Both wear plate and point securely attached with H & L flexpin.



ALL H & L POINTS ARE MADE OF ROLLED HIGH ALLOY STEEL (NOT CAST)

The majority of bases and adapters are also made of rolled high alloy steel.

H&L

TOOTH COMPANY

1540 SOUTH GREENWOOD AVE. MONTEBELLO, CALIFORNIA

For more facts, use Request Card at page 18 and circle No. 367



Steel workers rig 5-foot 3½-inch-deep floor guides for a lift. A Diamond T truck pulls the Fruehauf trailer under the traveler so that steel can be picked up.

(Continued from preceding page.)

towoc 3900 crane transferred them to a flat-bed trailer that hauled the steel under the traveler on the bridge. The two-boom tower traveler handled a 115-ton stiffleg derrick in front and a 25-ton derrick in back. Four falsework bents resting on timber spread footings were used on this span.

No falsework for center span

The 1,575-foot center span will be built without falsework bents by cantilevering it out over the river from piers 2 and 3. Since the 689-foot suspended span is only hinged to the cantilever arms on either side, it is necessary to make the junction between the two sections rigid before the cantilevering can continue into the suspended span. This joint is made with the help of two 800-ton jacks at each of the junction points of top and bottom chord members. The jacks are used to facilitate final adjustment when the ends of the cantilevered sections meet.

High strength steel

A high-strength steel with a basic working stress of 30,000 psi was used, whenever it was advantageous, on main truss members to reduce weight. A medium-strength steel with a basic working stress of 20,000 psi was also used. The bridge was designed for a wind load of 70 psi with permissible unit stresses of 40 per cent above

basic, in combination with dead load. The principal tension members in trusses near the vicinity of the cantilever piers are high-strength steel eye-bars.

The trusses of the bridge, which are 64 feet from center to center, carry a 52-foot roadway with 3-foot safety walks on either side. The bridge is designed to carry four lanes of traffic, and there is a future possibility of converting it to five lanes to handle peak traffic loads.

The top members of the truss consist of 30×40-inch built-up box chords, and 30×48-inch chords form the bottom members. In the suspended span, the bottom chord is reduced to 30×40 inches. Floor beams, crowned on top, have a center depth of 6 feet 5½ inches. The floor beams

support eleven 27-inch rolled I-beam stringers that carry the roadway. The roadway between piers 1 and 3 is a steel-grid type covered with corrugated plate on which 1½ inches of asphalt surfacing is placed. As additional weight was required in the shorter span between piers 3 and 4, a 7½-inch reinforced-concrete deck is called for in this section for additional counterbalance.

The principal quantities for the cantilever span include 16,200 tons of fabricated steel, 900 tons of eye-bars, 1,400 tons of grid flooring, 30 tons of aluminum grating, 108 tons of reinforcing steel and 820 cubic yards of concrete.

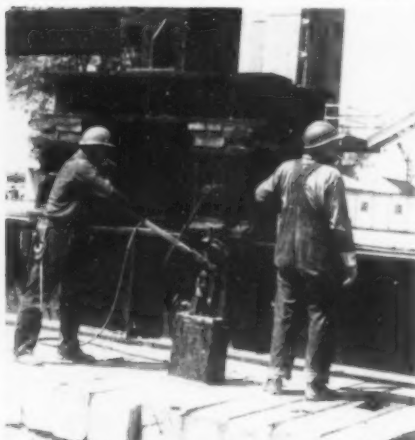
Deck truss spans

As work on the cantilevered trusses

TIGER BRAND WIRE ROPE at



Building the Long Sault Dam. When completed, this dam will contain approximately 653,000 cu. yds. of concrete. The three large gantry cranes used in pouring this concrete are rigged with Tiger Brand Wire Ropes.



A steel worker operates a hydraulic jack to raise the falsework bent and adjust the position of the deck truss. The hydraulic jack operates with two mechanical jacks on either side. A similar setup is used on the other leg of the bent.



Sticky marine clay weighs almost twice as much as regular overburden, puts greater strain on wire rope and equipment.



Shovel rope takes a beating and Tiger Brand is made to withstand rough service and heavy abrasion.



proceeded outwards over the river, erection of the steel for the deck truss spans thrust inland towards New Orleans and towards Algiers. Bethlehem Steel Co. also has this \$4 million contract, which includes fabricating and erecting the five deck truss spans on the New Orleans side and the three deck truss spans on the Algiers side.

Steelwork started at the end piers of the main bridge and proceeded outwards. On the Algiers side, steel handling was essentially the same as it was for the main bridge. Flat-bed trucks, carrying steel from the stockpile at the railroad, were unloaded by the 25-ton traveler riding the deck truss. This work is carrying the span into the river, and to completion.

On the New Orleans side, steel ar-

rived on tracks running under the first deck-truss span. After being stockpiled, it was rehandled by a crawler crane that gave the steel to a 25-ton stiffleg derrick mounted on the superstructure at pier 1. The derrick placed the steel on a dolly, running on rails atop the truss, which fed the 25-ton traveler.

Personnel

The Mississippi River Bridge Authority has Neville Levy as chairman and Frank X. Armiger as administrator. Otto F. Sorgenfrei is project engineer for Modjeski & Masters, the consulting engineering and designing firm for the project. Bethlehem Steel Co. has L. L. Feidler as resident engineer.

THE END

Final cleanup of a completed wrecking job is made by the H-5 Hydrocrane. A bucket of material dumps into waiting truck.



Case history

Truck crane demolishes 6 to 8 houses daily

Mechanization of what used to be a hand labor job has increased production while cutting costs for the Lucas Wrecking & Salvage Co., Paramount, Calif. Specifically, use of a Bucyrus-Erie Hydrocrane is speeding and cutting the cost of its wrecking operations.

Many buildings and houses built half a century ago are being moved to make way for highways, more adequate housing, and apartment buildings. Some wrecking outfits still use labor crews to dismantle and tear down these buildings, and up to a short time ago Lucas did, too. It took a crew of five men 2 to 3 days to wreck a small three-room shack, and the salvage value of lumber and other materials often fell far short of what the wrecking contractor had spent in wages.

Lucas now does the same job in an hour. The hydraulically-powered jaws of the clamshell bucket on a Bucyrus-Erie H-5 Hydrocrane literally chew a building to pieces.

On typical right-of-way clearing, Lucas has increased his production from a third of a house per day to between six and eight wrecked units—a jump of 1,800 per cent. And he's reduced his crew to three men—a crane operator and two truck drivers. Costs have been reduced considerably.

For further information on the Hydrocrane, write to Bucyrus-Erie Co., Dept. C&E, South Milwaukee, Wis.

Circle No. 222.

Elizabeth Iron Works celebrates 50 years

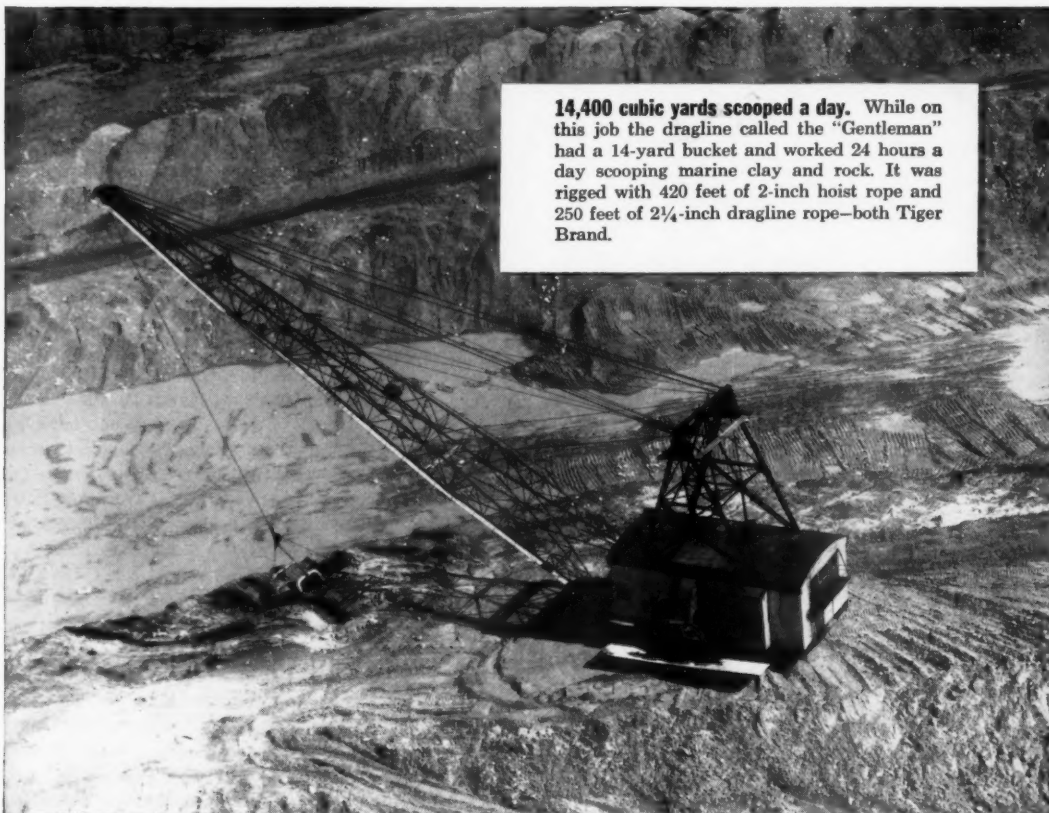
To mark the beginning of its 50th anniversary, Elizabeth Iron Works, Inc., Union, N. J., placed a gold bolt in the structural steel framework of Hangar 14 at Newark Airport, Newark, N. J. The ceremony marked the completion of the first phase of construction of the new hangar being erected by the Port of New York Authority for United Air Lines.

For the remainder of this year, Elizabeth Iron Works will make the final bolt or rivet in a structure a gold one.

at work on St. Lawrence Seaway and Power Projects

THE FABULOUS ST. LAWRENCE SEAWAY and St. Lawrence Power Projects are the largest construction undertakings of all time, costing over \$900 million for the Seaway and power development. To keep the big machines working at top speed requires all kinds of wire rope—and most of it is USS American Tiger Brand.

Speed was such an important factor on this job that all equipment and supplies were selected with trouble-free performance in mind. American Steel & Wire set up a wire rope warehouse nearby for quick deliveries of any type of wire rope needed. Here are a few illustrations of the many jobs being performed by Tiger Brand Wire Rope.



14,400 cubic yards scooped a day. While on this job the dragline called the "Gentleman" had a 14-yard bucket and worked 24 hours a day scooping marine clay and rock. It was rigged with 420 feet of 2-inch hoist rope and 250 feet of 2 1/4-inch dragline rope—both Tiger Brand.

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS AMERICAN TIGER BRAND WIRE ROPE

Excellently Performed



UNITED STATES STEEL

For more facts, use Request Card at page 18 and circle No. 368



Big dam job takes big equipment for



Two "firsts" work together on the Oahe job. The Marion M-191 electric shovel with 13-yard dipper is the first built by Marion. The first LLD produced by Euclid was purchased in 1949 for work on Fort Randall Dam.

Best day sees 145,000 cubic yards moved

by trucks and shovels; work ahead of schedule

despite extra yardage caused by slides

Big shovels, draglines with 6 to 14-cubic-yard buckets, a fleet of thirty 50-ton trucks, and many smaller machines made efficiency more than a word during earthwork at Oahe Dam in South Dakota.

These rigs hit an average daily production of 100,000 cubic yards of earth moved in the two 10-hour shifts worked throughout the season. In the best day, they set what is probably an all-time record for earthmoving by the load-and-haul method—145,000 cubic yards.

Big job on big dam

These daily production records do not seem half as startling when they are related to Oahe Dam. This main stem structure on the Missouri River just north of Pierre, S. Dak., will be the second largest dam in the world, ranking only behind Fort Peck Dam on the Missouri in Montana.

Oahe, 242 feet high and 9,300 feet long, will have a finished embankment containing 78 million cubic yards of earthwork. The project will cost more than \$380 million. A key unit in the Pick-Sloan Plan for the development of the Missouri River basin, Oahe Dam is the fifth of the main stem structures to be put under construction by the U. S. Army Corps of Engineers. Fort Peck in Montana, Fort Randall and Gavins Point in South Dakota, and Garrison in North Dakota are already in operation.

Holds three contracts

Western was the successful bidder on Earthwork Stages IV and V and on the Stage I Spillway contract. The Earthwork Stage IV contract originally called for the excavation of 16 million cubic yards, but a huge slide made it necessary for this figure to be increased to more than 22 million yards. The Stage V job includes 19 million cubic yards of excavation. Both jobs are located on the east bank of the river.

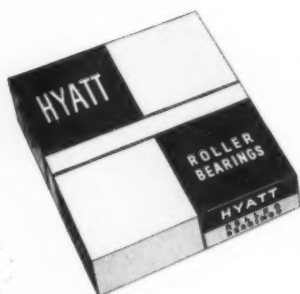
The Stage I spillway excavation on the opposite side of the river includes about 5 million cubic yards of excavation, none of which is going into the dam. Together, the three contracts total more than \$12 million and call for 36 million cubic yards of excavation—without the addition caused by the slides.

Stage IV was the first earthwork contract on the east bank of the river. The huge excavation removes glacial till and shale to grade an area for the big powerhouse that will soon be started. The excavated material, plus the material removed because of the slides, is going into the

CONTRACTORS AND ENGINEERS



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dam to build 11 million cubic yards of compacted embankment and 4 million yards of uncompacted embankment.

The Stage V work, started in March, 1956, and scheduled for completion in February, 1958, will result in 10.5 million cubic yards of compacted embankment and 7.5 million cubic yards of uncompacted embankment. This will bring the section east of the river channel substantially to finished grade, leaving the closure section to be completed under succeeding contracts.

Dewatering

One of the early Stage IV operations was the preparation of the foundation in an old river chute near the east bank. This area was dewatered down to an elevation 36 feet below the normal river level.

As the water level was drawn down, three big draglines bailed out the river bottom materials and loaded them into a fleet of the Euclid LLD 50-ton trucks. The largest of these draglines was a Marion M-191 with a Hendrix 14-yard bucket. The others were a Marion M-151 with an 8-yard bucket and a Bucyrus-Erie 71-B with a 4-yard bucket. Excavated material was hauled to sections of uncompacted embankment or to waste areas.

Excavate to bedrock

This excavation was carried down to shale bedrock for foundation. Since the shale deteriorates rapidly when exposed to the weather, the contractor was required to backfill over the shale within 24 hours after the cleanup operation had exposed the surface. The backfill for the dam embankment was hauled in by a spread of Euclid 25-yard bottom-dumps from the east bank excavation.

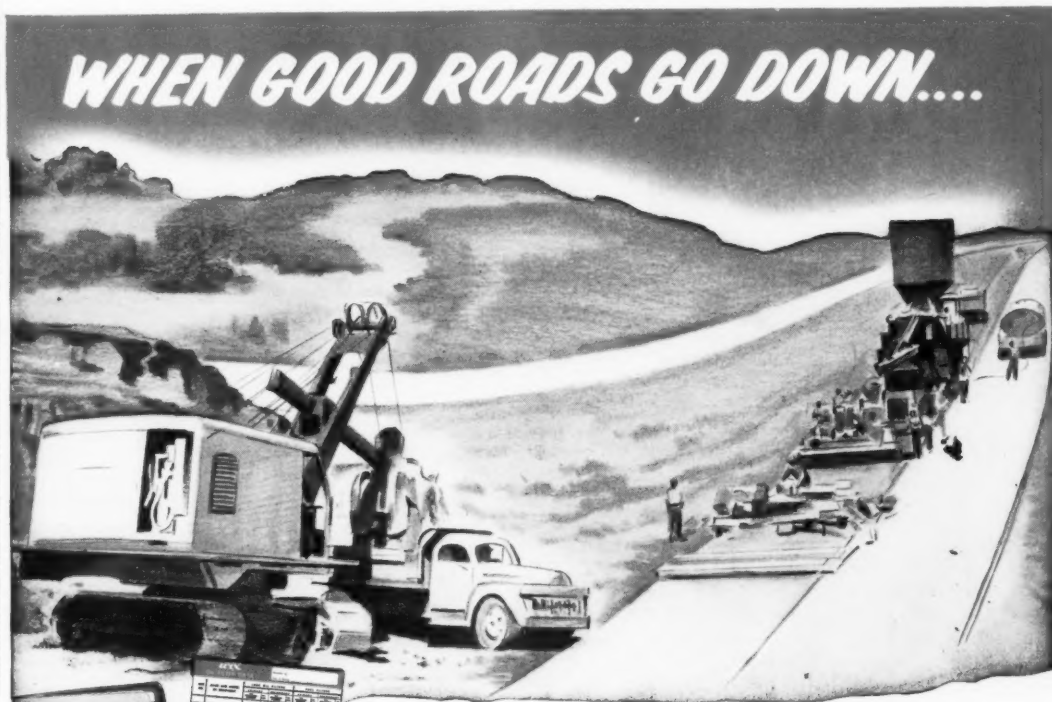
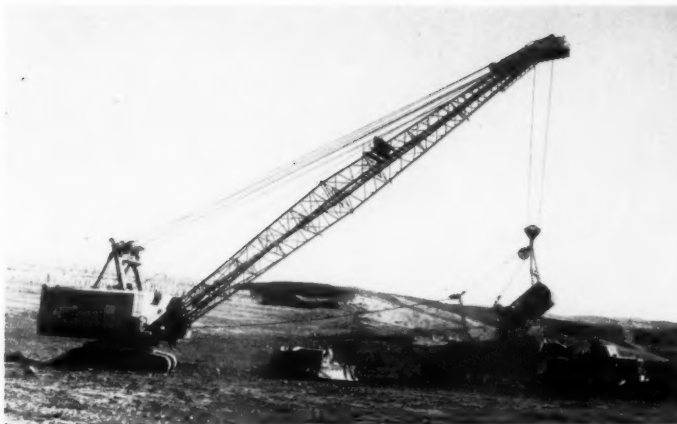
Experience with earlier stages on the west bank had shown the economy of applying moisture to the cut areas before the excavation was started instead of watering the material on the fills. Western awarded a subcontract for this work, and the subcontractor used sprinklers to do the job.

Wet with sprinklers

The sprinklers, similar to those used in irrigation, were supplied by two Peerless vertical turbine pumps set in wells near the river. They applied water at a rate of 2 inches per foot for the top 30 feet of cut. Since the average rainfall in this area is

(Continued on following page)

One of the four M-191 electric shovels, converted to a dragline for excavation of the glacial till going into the embankment, uses a Hendrix 12-yard bucket to load Euclid 18LDT bottom-dumps. The Cat D8 tractor-dozers clean up around the rigs.



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Though smaller than the huge draglines loading out fill for the embankment, this Manitowoc 4500 with 6-yard dragline bucket does its share of the work. The glacial till being loaded to the Euclid 18LDT contains boulders of assorted sizes.

(Continued from preceding page)

about 16 inches, this application of water equalled almost four years of rain for the area.

Irrigating to depths greater than 30 feet was not considered practical; material lying this deep was watered after it had been placed on the embankment. Seven Euclid 6,000-gallon water wagons hauled up to a million gallons of water per day to moisten this material.

Big shovels move dirt

The overburden of glacial till, containing boulders of assorted sizes, was loaded by the big shovels and draglines to Euclid end and bottom-dumps hauling to the embankment. Four big Marion M-191 electric shov-

els were the backbone of Western's excavating spreads. Three of them were fitted out as shovels with 13-cubic-yard dippers. The fourth was used as a dragline and handled Hendrix buckets up to 14 cubic yards in capacity.

Thirty of the huge Euclid 50-ton end-dumps—whose use Western had pioneered on the Fort Randall Dam project in 1950—were on the job to match the capacity of the big excavators. In fact, some of the trucks and shovels being used at Oahe are the same machines that hauled millions of yards of dirt on Fort Randall Dam, Gavins Point Dam, and other projects around the country.

In addition to these large units, the contractor had a Marion M-151 dragline with a Hendrix 8-yard bucket and a Manitowoc 4500 dragline with a Hendrix 6-yard bucket. Other haul units included 25 Euclid 18LDT bottom-dump wagons and 11 Mack 18-yard end-dump trucks. A fleet of dozers, rollers, motor graders, water trucks, and other equipment supported the excavating and haul units.

The bottom-dump Euclids, which normally carry about 25 yards, were sideboarded to increase their loads to 30 yards—almost equal to the 35-yard capacity of the Euclid LLD end-dumps. These sizes matched the loading equipment well, since three dips of one of the big shovels or draglines put a heaping load on either type of haul unit.

When the excavation got down to the shale, drilling and blasting were started to prepare the material for the shovels. Two Failing rotary drills put down the 5-inch-diameter blast



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Of course, you don't work at 70% grades! But top honors for the Oliver OC-12 at a recent hill-climbing competition prove that you have the correct power-to-weight ratio that means top tractor performance wherever your job takes you.

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obstructed clearance. You go over mud, stumps, rocks, etc. Even the final drive housing is close to the track frame and protected—not out in the open where it could pack up in deep going.

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cedure never changes, regardless of grade...uphill or down. No clumsy cross-hand steering ever. Works with full line of attachments. High-torque 53 d.b.h.p. diesel; also gasoline model.

Check out this modern crawler yourself. Ask your Oliver distributor for a demonstration or write for important new catalog.



Lined up along the embankment, these big light towers illuminate the area for night work. Each of the 20 mobile towers has eight 1,500-watt floodlights powered by a Cat D315 generator. They stand 25 feet high, but can be raised to a height of 60 feet.

holes to a depth of 20 feet on a 15 x 15 or 15 x 17-foot pattern. Holes were loaded with 50 pounds of Hercules EP197C Nitro carbon nitrate and a 12.5-pound stick of Gelamite, and these were detonated by a No. 6 blasting cap. Exceptionally good breakage minimized the work of pulverizing the material on the fills.

The contractor trucked the explosives to the job all the way from the plant at Carthage, Mo., in a big Fruehauf van pulled by a 300-hp International Westcoaster.

Building embankment

As the haul units delivered the material to the embankment areas, Cat-

CONTRACTORS AND ENGINEERS



THE OLIVER CORPORATION

400 West Madison Street, Chicago 6, Illinois

a complete line of industrial wheel and crawler tractors and matched allied equipment

For more facts, use Request Card at page 18 and circle No. 359



A Euclid TS-18 twin-powered scraper, push-loaded by a Euclid TD-12 tractor, works on the Stage 1 spillway excavation. Ten of these units, five Euclid 8TDT scrapers, and five TC-12 push tractors comprised the fleet on this work.

Fitted with lights for after-dark operation, the Marion M-191 keeps loading out to the Euclid LLD's 20 hours a day, seven days a week.



erpillar D8 tractor-dozers spread the loads to shape the required lifts. In the compacted fills, the material was spread in 12-inch-deep lifts. In the non-compacted fills, lifts of 18 inches were permitted.

All rocks were removed from the 12-inch lifts; in the 18-inch lifts, it was possible to leave boulders up to 2/3 of the depth of the lift in the uncompacted fill. A Cat D6 and a D8, equipped with Fleco rock rakes, worked over the fills as they were built, raking out the larger bould-



Boulders up to 2/3 the depth of the 18-inch lifts for uncompacted fills were left in place. Larger rocks, being removed from the deeper fills by a Cat D8 with Fleco rock rake, will be stockpiled for use as riprap on the face of the dam.

ers. The tractors pushed the rocks into piles to be loaded by an Allis-Chalmers HD-20G Tracto-Shovel into Mack 18-ton trucks hauling to a huge stockpile. Boulders in the stockpile were stored for later use as riprap on the face of the dam. By the end of last season, the pile contained more than 90,000 cubic yards of boulders.

The shale going into the embankment had to be thoroughly pulverized before it could be compacted, and this job was effectively done by big Gebhard spike-tooth rollers pulled by Allis-Chalmers HD-20 or Cat D8 tractors. These rollers resemble the big Gebhard sheepsfoot rollers, but their feet taper to sharp points instead of being flat on the ends.

As the shale was being worked on the embankments, it was brought to optimum moisture content by seven Euclid 6,000-gallon water tankers. Scarifiers attached to the rear of six of the Caterpillar D8 tractor-dozers helped to manipulate the material and get uniform distribution of the water through the lift.

The final compaction of the compacted embankments was applied with three passes of the Ferguson 50-ton rubber-tire compactors.

Work continued day and night on two 10-hour shifts, and a great deal

(Continued on following page)



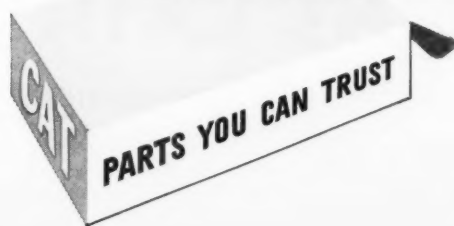
"500" means up to 500 work hours between lubrications from new CAT* rollers. Add up the savings in service time and labor costs this feature gives you! Available for Caterpillar D7, D8 and D9 Tractors, the Cat "500" Roller also features large load carrying bearings, deep hardened forged steel rims, selectively hardened shafts and special long-lasting seals. Other makes of

rollers may look like originals, but can you trust them? Be sure to get parts you know—from your Caterpillar Dealer.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

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For more facts, use Request Card at page 18 and circle No. 370

(Continued from preceding page)



Fifty tons of fill is added to the embankment by a Euclid LLD. The chunks of shale, easily loaded by the big shovels and hauled by the huge trucks, are broken up for compaction by a Gebhard spike-tooth roller pulled by an Allis-Chalmers HD-20.

of light was required to illuminate the big embankment area during hours of darkness. Western had 20 big portable light towers at the site, each carrying its own Caterpillar D315 generator set. Every rig had eight 1,500-watt floodlights mounted on the top of a telescoping tower that was usually 25 feet high but capable of being raised to a height of 60 feet.

Slides

During the course of the Stage IV excavation, a huge slide occurred in the east abutment area where the work was under way. The slide movement was very gradual, but over a period of about 6 months, it was estimated that some two million cubic

yards of material had been displaced as much as 12 feet laterally and 30 feet vertically.

Slides of this nature are a common and natural occurrence along the Missouri River banks in this area where seams of Bentonite lie between the layers of the shale bedrock. The Bentonite becomes slippery when wet, and it is suspected that this condition contributes to the slides.

To correct the situation, it was necessary for the contractor to remove all of the slide material, then flatten the excavation slopes. Slopes previously planned at 3 to 1 were flattened to 5 to 1, and those originally planned at 5 to 1 were flattened to 6 to 1. These changes resulted in an increase of Stage IV excavation by more than 5 million cubic yards.

Spillway

Western's third contract, the Stage I Spillway excavation, is located across the river in a big draw about a mile west of the west abutment of the dam. The complete spillway will require the excavation of 30 million cubic yards of material and the placing of 360,000 cubic yards of concrete. The first stage called for 5 million cubic yards of excavation, and the second stage work, under way this season, contains 18.6 million yards of excavation.

The spillway excavation is used to build up the side slopes of the spillway or is wasted; none of the material goes into the dam embankment.

To start the excavation, the contractor used several spreads of scrapers, including ten Euclid TS-18 twin-powered scrapers, five Euclid 8TDT scrapers and five Euclid TC-12 twin-powered push tractors. These spreads removed all of the over-burden and carried some of the excavation down into the shale.

Completion of the shale excavation was done by one of the Marion M-191 13-yard shovels, which was moved to the spillway together with ten of the Euclid 50-ton end-dump trucks, three Caterpillar D8 tractor-dozers, and three No. 12 motor graders.

On the east bank operation, the electric power for the Marion shovels was obtained from commercial power sources through transmission lines and transformer stations set up on the site. But since power was unavailable on the spillway location, the contractor had to bring in a big portable generator. This was a Cleveland Model 567A 16-cylinder diesel engine driving a 1,000-kw Elliot generator. A 12-ton flywheel was added to the unit to level out the tremendous fluctuations in load caused by the operation of a single shovel from the generator.

Operate ferry

Under the stage IV and V Earthwork contracts, the contractor was required to maintain ferry service across the river. When Western got the spillway contract, this ferry proved very convenient for transporting supplies, equipment, and personnel between the main operating base



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For more facts, use coupon, or Request Card at page 18 and circle No. 371



The ferry that Western had to operate across the river under Stage IV and V Earthwork contracts proves convenient for transporting supplies, equipment, and personnel between the east and west banks.

on the east bank and the spillway operation on the west bank.

The ferry consisted of a barge—big enough to take two ordinary trucks—pushed by the tugboat Apache. The Apache is powered by a pair of General Motors 6-71 diesel engines. The ferry carried its own hinged loading ramp and operated from prepared earth ramps on both banks of the river.

The Stage I Spillway excavation was started in April, 1956, and the 5-million-cubic-yard-project was completed by the middle of November. During this same construction season, the contractor moved more than 16 million cubic yards under the Earthwork Stages IV and V to bring the season's total to more than 21 million cubic yards. In spite of the huge additional yardage that had to be moved to correct the slide, the contractor stayed ahead of schedule on the Stage IV work. When the work for the season, just slightly more than a million cubic yards of earthwork remained to be moved under this contract.

Personnel

Supervising this tremendous operation for Western Contracting Corp. is project manager Carl "Rip" Collins. His staff includes superintendent A. "Blackie" Blackwell, night superintendent Bob Cressman, and project engineer Jim Jensen. The field engineer is Ralph Gustine, and the safety engineer, A. S. Barker. Tom Taylor was superintendent of the spillway excavation.

The entire Oahe project is under the supervision of John W. Sibert, area engineer for the Corps of Engineers. The assistant area engineer is Charles R. Brown, the engineering assistant is Sherman W. Williams, and the resident engineer for the earthwork is L. G. Leavitt. The operation is under the over-all supervision of the Omaha District of the Corps, of which Col. T. J. Hayes, III is district engineer. THE END

David White appoints two

John Forsdick has been named district sales manager of the Framingham, Mass., office of David White Instrument Co., Milwaukee, Wis. The firm has also appointed Roy Boehringer district sales manager for its branch in Euclid, Ohio.

A. Theodore Lewis has been appointed district sales manager for the greater Chicago area. In his new job, Lewis will direct the firm's sales activities in the state of Illinois and the St. Louis, Mo., district.

Bid prices for interstate system higher in 1957

Bid prices for federal-aid highway construction in the first quarter of 1957 were 1.4 per cent higher than in the preceding quarter, according to Bertram D. Tallamy, Federal Highway Administrator. This figure is based on contracts for federal-aid highway construction awarded by state highway departments.

With 1946 as a base year, the price index rose from a low 125.5 in the second quarter of 1955 to 142.6 in the first quarter of 1957. This is an average increase of 1.8 per cent per quarter or 7.5 per cent per year.

The per cent of component items of the index that have increased in price are excavation, 1.6; surfacing,

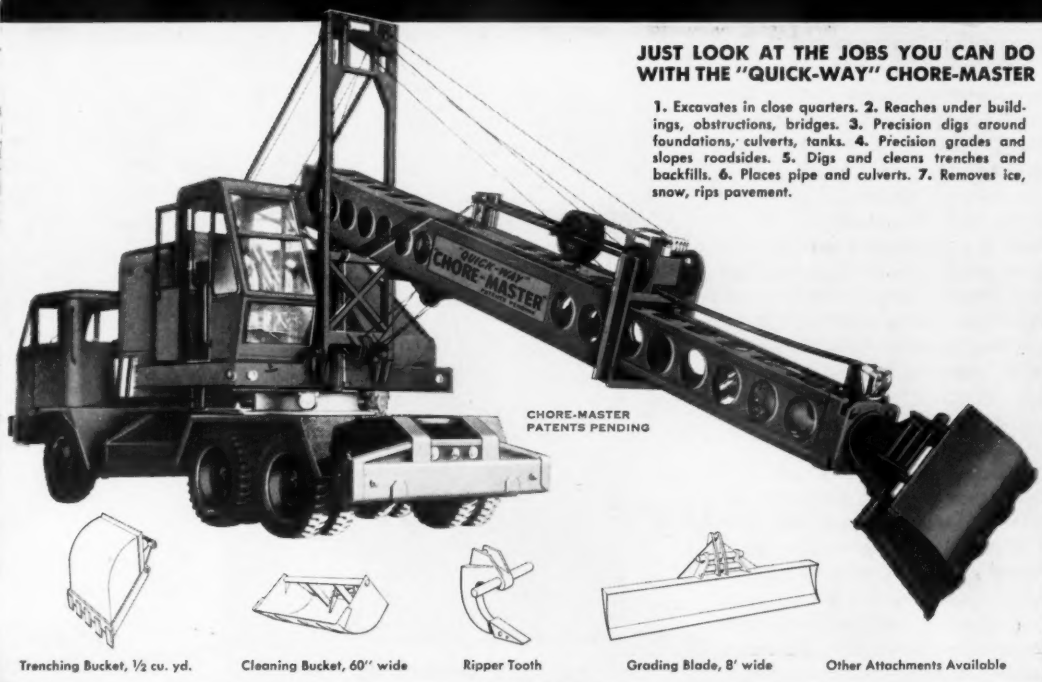
0.5; structural reinforcement, 4.1; structural steel, 0.3; structural concrete, 3.5; and structures, 3.2.

Secondary road program top of HRB bulletin

Highway Research Board Bulletin 147, "Secondary Road Program in North Carolina," presents data on that state's expenditures of \$350 million within a 5-year period, and \$478 million in 9 years for improvements. The report presents complete vehicle-mile and road use analyses by geographical areas before and after the large paving program.

Priced at 60 cents, the bulletin is available from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C.

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The new **"QUICK-WAY" CHORE-MASTER!**



JUST LOOK AT THE JOBS YOU CAN DO WITH THE "QUICK-WAY" CHORE-MASTER

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The new "QUICK-WAY" Chore-Master is the first interchangeable hydraulic grading-digging attachment that makes dozens of jobs possible with one attachment. Now with the new Chore-Master, five crane shovel models, and the most complete standard line of attachments, "QUICK-WAY" is the most versatile machine you can own.

Two large hydraulic cylinders and one hydraulic motor operate the reaching, digging and swivel action of the boom and bucket. A single control lever guides all these actions with a simple twist of the wrist for sure, precision, hydraulic control.

This new attachment can be changed quickly to any of the other "QUICK-WAY" standard attachments.

Now a "QUICK-WAY" is the most versatile machine you can own—with MORE ATTACHMENTS to handle MORE JOBS with greater profits:

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For more facts, use coupon, or Request Card at page 18 and circle No. 372



A Schramm compressor, with two special silencers mounted on top, powered the cement gun used to reline a smokestack without disturbing nearby hotel guests or office workers.

Case history

Quiet compressor calms construction cacophony

Removing and replacing the lining of a 247-foot smokestack in the courtyard between an office building and a hotel, without disturbing the occupants of either, may well seem like an impossible task. Yet, that is exactly what was accomplished recently by the Joseph McCollum Co., Marlton, N. J., contractor.

To power the cement gun machine for this job, McCollum used a 315-cfm 129-hp Schramm compressor, a gasoline-engine-driven unit. This compressor had to be run in a 100×200-foot courtyard, and the noise level had to be kept so low that it would disturb no one.

The first step was to take sound level meter readings in the courtyard to determine the normal level. This was found to range between 20 and 75 decibels. The compressor when loaded produced 95 decibels—too high to be unnoticed in such a confined area. The problem, then, was to quiet the compressor to an inconspicuous level.

It was solved by installing two mufflers—a Burgess-Norton unit, and a Donaldson air cleaner silencer. The compressor then averaged only 15 decibels—less than the lowest normal sound level in the courtyard. Less, in fact, then one-half the noise made by twelve typists with an average amount of work, typing in a small, reasonably soundproof room.

As a result, the job was completed with no complaints from either hotel guests or office workers. Hotel and office managers were pleased, and McCollum Co. has added to its reputation for handling tough assignments.

For further information on Schramm compressors, write to Schramm, Inc., Dept. C&E, West Chester, Pa.

Circle No. 221.

Thor branch office moves

The Houston, Texas, office of the Thor Power Tool Co., Chicago, Ill., has moved to new headquarters at 5503 Lawndale Ave. The move will enable the firm to provide better sales and service facilities to distributors in Texas, southern Arkansas, and the western fringe of Louisiana.

Case history

Tree boom-rake machinery gives "excellent" results

"Excellent" results were reported by the J. L. McIlvaine Co., Washington, D. C., contractor, in its use of a tree-knockdown boom and land-clearing rake assembly manufactured by the Rockland Allied Equipment Co.

Originally designed to meet the needs of construction men engaged in large land-clearing projects involving the removal of thick tree growth, the Rockland tree-dozer boom cuts into the tree as the tractor is driven forward, and is said to up-

root the entire tree without the necessity of digging around its base. Herman Boyer of the McIlvaine Co. reports that in 2,000 hours of satisfactory operation, pins and bolts were the only parts requiring replacement or repair.

For further information on the Rockland tree-dozer boom and rake front combination, write to Rockland Allied Equipment Co., Dept. C&E, 3778 W. Colonial Drive, Orlando, Fla.

Circle No. 134.

Here's the New R-18"Euclid"

that sets a new high in Rear-Dump Production and Performance!



DUMPS FAST AND CLEAN

Smooth body interior and tapered rear chute assures clean shedding of the load well back of the rear wheels—an important feature for dumping into hoppers or over the edge of waste banks.



STAY ON THE JOB LONGER

Rugged body and frame withstand the impacts of loading, hauling and dumping heavy excavation in construction, mine and quarry service.

More Work-ability and Minimum Maintenance

Designed and built for heavy off-the-highway service, Rear-Dump "Eucls" have paced the field for over 20 years. They've reduced hauling costs on hundreds of the toughest jobs in mine, quarry and construction work . . . delivered "plus" performance year in and year out.

This Model R-18 incorporates the engineering advances, the easy operation and maintenance features, resulting from unequalled field experience with other Euclid Rear-Dumps of 10 to 50 tons capacity. It provides the dependable work-ability that means more payloads per day at lowest cost per ton or yard moved.

Have your Euclid dealer give you full details on this new 18-ton Rear-Dump and the complete line of Euclid earth moving equipment. He'll be glad to show you why so many users have proved for themselves that *Euclids are your best investment.*

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

The R-18 is your BEST BET for Lower Hauling Costs!

Case history

Nylon fabric holds down moisture content in fill

A specially formulated vinyl-coated nylon said to withstand severe weather conditions and rugged abuse is being used by a contractor on more than one St. Lawrence Seaway project to effectively control moisture content in fill on dikes and dams.

B. Perini & Sons, Inc., Framingham, Mass., is using the Herculite protective fabric on a dike being constructed in connection with the Barnhart Powerhouse at Massena, N. Y. Thirty Herculite units, each 35 feet

long by 100 feet wide, were laid down over almost one-quarter of a mile of dike to prevent moisture content from exceeding 9 per cent.

Despite the inclement weather through the winter, the fabric kept moisture in the fill constant, thereby allowing the contractor to begin compacting operations immediately after the spring thaw.

For further information on these fabrics and their suggested uses, write to Herculite Protective Fabrics, Inc., Dept. C&E, 140 Little St., Belleville, N. J.

Circle No. 223

Case history

Welding process saves maintenance time, costs

The Arcair process for removing excessive or defective metal and broken or worn parts has been found to save roadbuilding contractors and equipment distributors from 25 to 80 per cent of the time involved in maintenance and repair, the company reports.

The Arcair torch uses air from an 80-psi air line and power from an ordinary dc welding machine with Arcair Copperclad electrodes. The operator strikes an arc with the electrode, which causes the metal to melt,



Removing the weld from a dipper tooth with the Arcair torch.

and the air which is permanently aligned with the electrode blasts the molten metal aside.

The Arcair process is recommended for a number of applications in repair or maintenance of construction machinery. Some of the more common ones include:

Bulldozers—edge preparation of dozer blades for rebuilding with manganese steel corner bits; removal of austenitic and ferritic weld metal; veeing out of cracks for rewelding; removal of surfacing for resurfacing; sharpening of blade edges by shaping.

Dipper teeth—preparation for welding repointer bars of manganese steel to worn teeth.

Buckets—preparation of worn surfaces of lips, sides, floors of buckets for relining with manganese steel applicator bars; removal of old hard-surfacing before resurfacing; removal of stainless weld metal for repair of worn or damaged sections.

Pads, sprockets, idlers and rollers—removal of old hardsurfacing before resurfacing (Arcair quickly and economically flushes off areas, allowing new deposit to be laid on clean metal); beveling and gouging of cracks in defective parts (done, in most cases, without dismantling).

Crusher jaws, gyrator cones and concaves, crusher rolls—old surfacing can be removed with Arcair for resurfacing or welding of round manganese steel applicator bars; old worn bars may be quickly removed for rebuilding.

Tractor grousers—grousers may be beveled for manganese steel applicator bars to insure 100 per cent penetration welds; worn bars may be replaced by removing only the weld metal, thus insuring the same height after repair work.

Cast-iron housings, gear cases and blocks may be prepared for welding with cast-iron electrodes without dismantling the equipment.

Rivets and bolts—heads can be flushed off quickly and shanks knocked out with a punch.

Bearing races and sprockets—if frozen, can be removed from shaft without damaging shaft.

For further information on the applications and advantages of the Arcair process, write to the Arcair Co., Dept. C&E, 423 S. Mt. Pleasant Ave., Lancaster, Ohio.

Circle No. 129.

For more facts, circle No. 373

Advanced design results from 20 years of leadership



Some of the OUTSTANDING FEATURES of the R-18

- 10½ yd. body
- 36,000 lb. payload
- 218 h. p.
- loaded top speed of 27 m.p.h.
- hydraulic booster steering
- air assist clutch
- free floating springs
- 16.00 x 25 drive tires



POSITIVE CONTROL OF DUMPING

Double-acting 3 stage Euclid hoist and hydraulic system gives the operator fast, positive control of the body position at all times. Dumping angle of the body, in fully raised position, is 68°. Body, frame and hoist are designed and built as an integral unit.



SPEED AND STABILITY

The 5 speed transmission and Euclid planetary axle provide a top speed of 27 m.p.h. with full 18 ton payload. Free floating Euclid spring suspension gives maximum stability empty or loaded under all road conditions...permits faster safe travel speeds.



EASY OPERATION

Full width cab offset to left for maximum vision, air assist clutch, booster steering, 218 h.p. engine, fast acting hoist, free floating springs and fully adjustable seat contribute to driver comfort and easy operation.

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE





Pile drivers challenge open sea in pier construction

A barge-mounted McKiernan-Terry S-8 pile hammer drives the batter piles for the approach pier. The contractor assembled the pile driver from a 65-foot frame. The 85-foot swinging leads permit a 3 to 1 batter from the vertical.



"This Anthony Trailer carries two extra tons every time it leaves the quarry

...and outhauls any six-wheeler I'm familiar with."



The Teleramic "V" Seal Hoist Is A Major Factor In Frameless Trailer Success

Proven "V" seal packing is only one of many quality features in the Teleramic Hoist design. Because the dry operating "V" seal is self-adjusting, repacking or manual adjustment of the Teleramic cylinder is very rarely needed. "Truss rings" encircle and reinforce the ends of each cylinder tube to prevent "flaring". Extra long bronze bearings and long overlap of the cylinders help keep them perfectly aligned.

A. J. Jalovec, Sr.
A & J CARTAGE
5953 Archer Road, Argo, Ill.

Like you, Mr. Jalovec likes to see fixed job costs go down. Every two tons of extra legal payload he hauls with his Anthony Trailers means less time per job. Because this frameless dump body is lighter for its load capacity, gas and oil costs are also cut. Mr. Jalovec says maintenance on this dump body is "nil" . . . Anthony distributor service is "wonderful".

A & J Cartage generally uses this Frameless Trailer to haul 30,000 pounds of payload from the quarries to ready-mix batch plants. There, his drivers dump right into the hoppers.

The hoist is in an extreme forward position with much of its weight up front. That's why Mr. Jalovec can haul more legal payload on the important rear axle.

To cut costs on your jobs, check into the long list of Anthony Teleramic Hoist and Dump Body models. One is tailored to suit your particular operation.

Buy The Dump Body That Has The Service

Over 100 Anthony Distributors are located nationwide. At least one is convenient to you . . . Ready to give immediate service on all Anthony equipment. Complete descriptive literature is now available on Anthony Frameless Dump Trailers and Teleramic Hoists. No obligation, of course! Write to: 1754 Baker St.

ANTHONY COMPANY • Streator, Illinois

For more facts, use Request Card at page 18 and circle No. 374

Skilled crews with big pile drivers are keeping one of the toughest jobs on record from falling behind schedule. A great deal of skill and patience are enabling the crews to battle the swell of the open sea, high winds, and Atlantic storms and, at the same time, sink 1,100 steel H-piles for the \$65 million naval base in Cadiz Bay, Rota, Spain.

The main pile driving operation for the naval base, which is for a petroleum, oil, and lubricants pier, is being done by Corbetta-Coviles, a joint venture of Corbetta Construction Co., New York, N. Y., and Construcciones Civiles, Madrid, Spain. The pier will rise more than 60 feet above the floor of the finished harbor and will have pipelines leading to an underground tank farm.

Pile-driving work

The 1,100 steel H-piles range from 70 to 120 feet in length. In deep water, 800 14-inch piles weighing 73 pounds per foot, and in shallow water, 300 12-inch piles weighing 53 pounds per foot are being used. All piles have to reach a penetration of 10 meters or a minimum bearing of 50 tons.

The initial 12-inch H-piles, positioned by a timber frame, were driven by a crane-mounted McKiernan-Terry S-5 pile hammer. These piles were used for the approach pier.

Batter piles for the approach pier were driven by a barge-mounted McKiernan-Terry S-8 pile hammer. The pile driver, assembled from a 65-foot frame, has 85-foot swinging leads which permit a 3 to 1 batter from the vertical.

This S-8 and another S-5 were also used for driving steel sheet piling required for a cutoff wall for a large temporary pier and a pipe trestle. The pipe trestle will bring cement directly into the shore area from barges about 300 feet offshore.

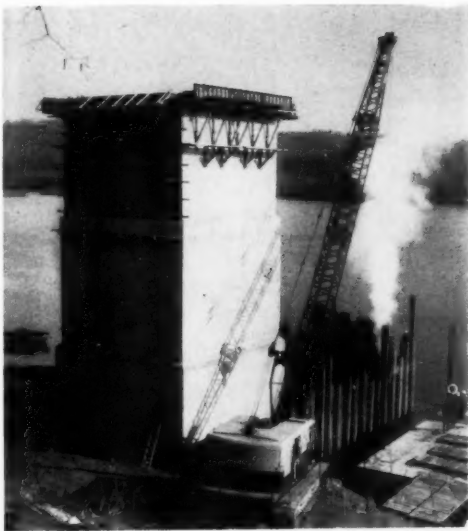
THE END

Case history

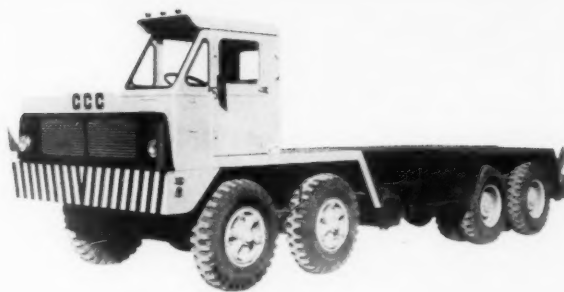
Steel sheet piling resists flood water

Electing to "do it the hard way" paid off in an unexpected manner for Roy Ryan Sons Co., Inc., Evansville, Ind., during construction of a pumping station for the Ashland, Ky., city

CONTRACTORS AND ENGINEERS



L. B. Foster steel sheet piling being driven to form a cofferdam from which wing walls protecting a pumping station pier will be laid.



Designed for a 30-ton crane, this 4-axle carrier is an outstanding item in Crane Carrier Corp.'s line. The Model 3084AW is powered by a Waukesha engine capable of 240 horsepower at 2,400 rpm. A Fuller transmission and Rockford clutch are other power train components. The carrier is 9 feet wide. Outriggers, rear fenders, outrigger jacks and floats, and running boards are optional equipment. Crane Carrier Corp., Dept. C&E, P. O. Box 5008, Tulsa, Okla. Circle No. 266.

water works on the Ohio River.

The contractor had to decide whether to erect one or two cofferdams to sink foundations for a concrete pier for the pump and wing walls protecting the pier. One cofferdam would have done the job, and required less work, but it would have extended 90 feet into the river, thus presenting a potential obstacle to river traffic. The job site is just above the U. S. Army Corps of Engineers Dam No. 29, and the contractor realized that ships jockeying for passage through the locks might swing into and buckle the long cofferdam.

As a safety measure, it was decided to use rented L. B. Foster steel sheet piling to build one small cofferdam for the pier and, when it was finished, erect a similar cofferdam for the wing walls. Proof that the decision was wise came from an unforeseen source, however. In mid-July, while work on the pier foundation was in progress, heavy rains caused the Ohio to flood. Work was halted for three weeks, but when flood waters receded, the small cofferdam was still securely in place. The contractor figures that the long cofferdam originally contemplated would surely have been torn loose by the flood, necessitating a new start on the whole project. As it was, work was continued without additional time loss.

When the pier was finished, a Bucyrus-Erie 38B crane stationed on a barge alongside the work pulled the steel sheeting. This was then re-driven to form the second cofferdam, measuring 45x55 feet. Erection time on this cofferdam was speeded by bolting two corner pieces of sheet piling to anchor bolts which had been set in the concrete pier. On both cofferdams, the piling was driven 25 feet through sand, gravel, and large boulders into bedrock of limestone.

For further information on this steel sheet piling write to L. B. Foster Co., Dept. C&E, 11 Park Place, New York, N. Y.

Circle No. 66.

Men are the best drivers. Some proof is supplied by an Arizona survey, which shows that though only 10.4 per cent of cars were being driven by women, 13 per cent of all drivers involved in fatal accidents were women.

EVEREADY WILL CUT YOUR COSTS WHEN YOU WORK WITH CONCRETE



Model E-36 PD
with "TIP-N-TURN"

A Model for EVERY Need

Select the Power for Your Job

For every concrete or asphalt cutting job, Eveready has the saw and blade to give low-cost, profitable performance. Big, ruggedly built to easily saw control joints on highways, turnpikes, airports. Maneuverable for all types of plant maintenance work... repairing, patching, trenching. Self-Propelled Powr-Drive on the Giant E-36 PD. Optional on the E-25 and E-15. Eveready Saws are built up to a Standard - not down to a price.

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- Ready-Cut Diamond Blades cut green or cured concrete or asphalt faster, easier, longer. Eveready Blades fit all makes of Concrete Saws.




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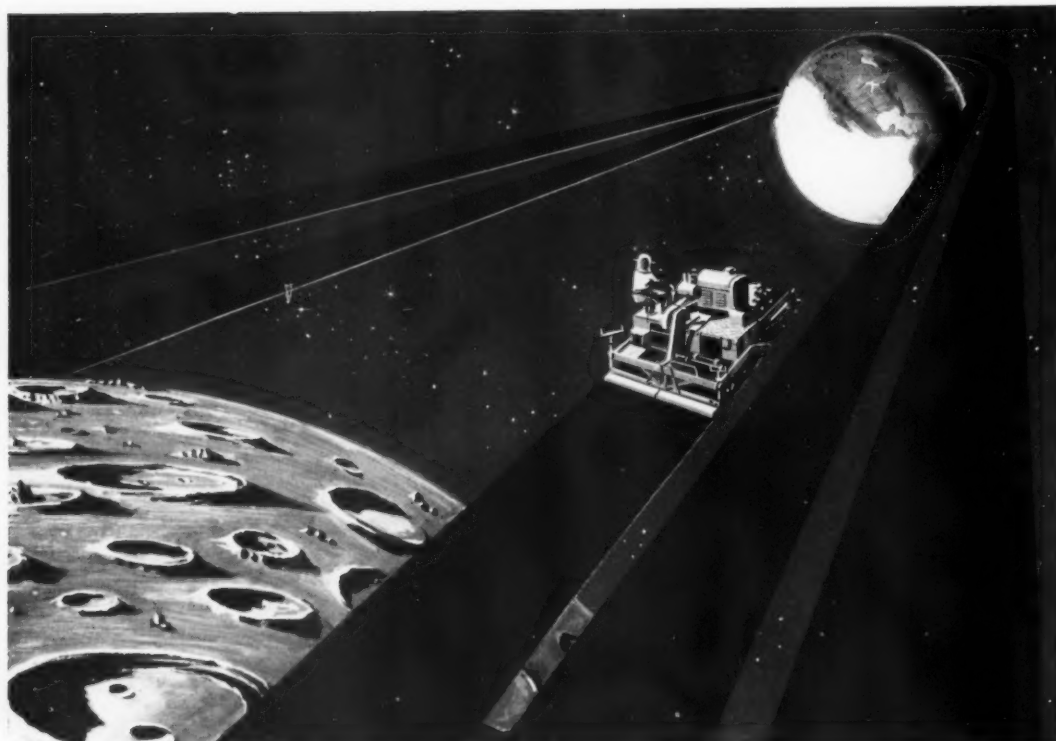


Machine-laid asphalt curbs and gutters:

a new concept spelling . . .

Efficiency and Economy

The following article is excerpted from a paper prepared by Fred Swineford, Columbus, Ohio, engineer, and William H. Schuelie of New York City for presentation at the annual meeting of the Association of Asphalt Paving Technologists earlier this year in Atlanta, Ga.



The 5th (s)trip to the moon has been started

By conservative estimates, the thousands of Barber-Greene Finishers throughout the world have started paving their second million miles. That is the equivalent of more than four trips to the moon. The current design of the Model 879-B is based on that experience.

Improving the Barber-Greene Finisher is not new. Scores of major improvements have been embodied in its design since it was first released to the field 20 years ago. Each engineering advance is backed by experiences in laying every type of mix in virtually all conditions.

Note to Barber-Greene Finisher Owners: You can have any and all of these improvements on your machine. Necessary parts are available in kit form for each separate modification. Write for the folder describing the various kits.

Barber-Greene

AURORA, ILLINOIS, U.S.A.



CONVEYORS...LOADERS...DITCHERS...ASPHALT PAVING EQUIPMENT

For more facts, use Request Card at page 18 and circle No. 376

During this era of great activity and rising labor costs, machine-laid asphalt curbs and gutters are being used widely as economical accessories on new roads, streets, airports, drainage installations, parking lots, and other projects.

Asphalt curbs and gutters, especially those that are machine laid, have four distinct advantages over other types:

1. They are more economical to build; according to figures available, their cost is about 20 per cent of that of other types.
2. They are easier to construct.
3. They can be constructed much faster.
4. They give better service.

Until several years ago, asphaltic concrete curbs and gutters were laid by hand methods, using stationary forms or slip forms with hand tamping.

As to the life of asphaltic concrete curb, a section laid by hand methods on U.S. 50, west of Fayetteville, Ohio, as far back as 1941 is reported to be in good condition today.

The Maryland State Road Commission constructed asphaltic concrete curbs prior to 1945 on U. S. 1, between Washington and Baltimore. These proved so satisfactory that Maryland is now constructing more asphaltic concrete curb.

In 1949, asphaltic concrete curb was laid on U. S. 25, north of Mount Vernon, Kentucky.

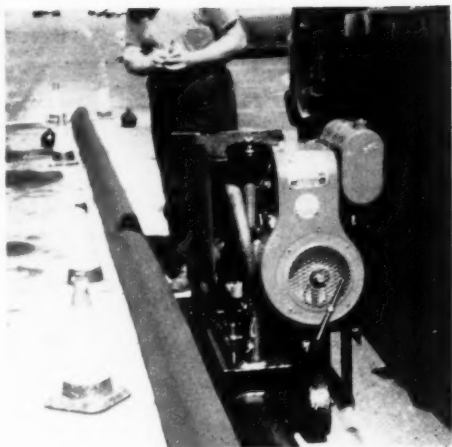
In 1954, asphaltic concrete curb was machine-laid at the Big Motors Test Track in Michigan, and I understand that the job inspectors reported satisfactory results at the time of construction, and that the company engineers are very well satisfied with the curbs after two years of use.

In 1955, six traffic islands were built with machine-laid asphaltic concrete curb at the heavy traffic intersection of Nagle and Dyckman Streets in upper Manhattan, New York.

These curb machines can place up to 2,000 feet of curb in one 8-hour working day, depending upon the machine's forward speed (4 to 7½ fpm) and the skill of the curber operator and the placing crew.

The method of placing is simple:
a) Guide lines are laid on the existing pavement by string or chalk lines. If the base upon which the curb

CONTRACTORS AND ENGINEERS



The Etnyre curb paver places asphaltic-concrete curb on pavement edge or next to any obstruction. Note smooth appearance of new curb due to heated mold.



A Dotmar curb and gutter machine paves 8½ fpm on a 14-mile-long job at Merced, Calif.

is to be laid is uneven, simple angle-iron tracks may be laid and the curber operated on these.

b) On the previously cleaned surface, a thin coating of rapid curing cutback asphalt, or emulsified asphalt, is applied to the pavement surface to provide a bond between the pavement and the curb mixture.

c) Hot-mix asphaltic concrete is then loaded into the hopper of the curber. The mixture is extruded or pushed out through the mold form under compaction pressure by a horizontal conveyor screw, driven by a small air-cooled gasoline engine. This compaction pressure causes the curber to move forward, leaving the curb behind it, and makes the curber self-propelled.

Cuts down labor crew

The operating crew usually consists of three men; one guides the machine, the other two keep the hopper filled with hot-mix.

With the proper mix, and an experienced crew, no hand finishing is required.

Of interest is the fact that asphaltic concrete curbs are not adversely affected by de-icing salts.

Some 500 of these curbers are in use in this country today—approximately 30 in Ohio, 25 in Michigan, and 50 in California, for example—and they are also being used in Western Europe, Central and South America, and the Middle East.

They are laying curbs for streets, traffic islands, median strips, drainage control installations, gutters, and bumper curbs for parking lots.

It should be noted that the proper percentage of mineral filler is most important in securing a successful mixture.

In using any new mix, it is wise to first experiment to determine the optimum composition and temperature. A mix suitable for high-type pavements may not be exactly the right one to use in an automatic curber. Too much asphalt can be fatal, as you all well know from your paving experiences.

In many locations, a standardized mix has been developed for use with automatic curbers, and is so specified by the authorities. I believe this practice is used by the Federal Housing

(Concluded on following page)

For more facts, circle No. 377 →

**ANOTHER
MODEL**

**NEW "Euc"
SS-18**

SCRAPER

...25 yards heaped



300 HORSEPOWER • TORQMATIC DRIVE

...high speed production over the long hauls

Consider this new Euclid for your earthmoving requirements. Designed for increased production on the long haul scraper jobs, the SS-18 combines power, speed and 18-yard struck capacity.

Six-wheel design provides good weight distribution and the stability needed for high speed, long hauls. A 300 h.p. diesel supplies the power through Torqmatic Drive. There's no clutch — change from any one of the three speed ranges to another is made under full power. Both drive and scraper tires are 24.00 x 25, with 29.5 x 25 optional for jobs requiring maximum traction and flotation.

For more details on this big high production scraper, contact your Euclid dealer...ask him to show you why Euclids are your best investment.

EUCLID DIVISION, GENERAL MOTORS CORP., Cleveland 17, Ohio



Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE



(Continued from preceding page)

Administration, the New Jersey State Highway Department, and many others.

The following mix is recommended by the Michigan Asphalt Paving Association: Mineral filler, 8 to 10 per cent 3MF; asphalt cement, 7 to 8.5 per cent; fine aggregate, 40 to 50 per cent sand 3BC; coarse aggregate, 40 to 50 per cent 25A or 31A; mixing temperature, 325; laying temperature, 250.

Credit should be given to such organizations as the Asphalt Institute, the New Jersey Bituminous Concrete Association, the Michigan Asphalt Paving Association, and many others, all of whom are spending their time and money providing literature, informative bulletins, suggested specifications, and other means to promote the wider use of asphalt curbs and gutters, and to help develop the best types of mixes to use with the automatic curb machines.

Bid prices

Some idea of prices being bid for machine-laid asphaltic concrete curbs may be had from the following examples:

On large state highway jobs in Ohio, a mile or more in length, bid prices were \$.70 per foot.

On small jobs for parking areas, bid prices vary from \$1.00 to \$1.50 per linear foot, due to the cost of moving in and out.

With the average mold, one ton of asphaltic mix will lay approximately 75 feet of curb.

There are 22 standard mold sizes and shapes available, for example, with one manufacturer's machine, ranging in height from 4 to 12 inches and up to 10 inches in width at the base.

One job reported laying 3,900 linear feet of curb in one day; another placed 6 miles of curb in two weeks.

It is estimated that machine-laid curbs, and curbs and gutters, can save approximately \$10,000.00 per mile of street over the cost of hand methods, using conventional forms.

The City of New York is said to have lowered its curb construction cost from \$5.00 to \$.50 per foot, using automatic curbers.

Some contractors owning curbers have reported that their cost for labor and material was approximately \$.35 per foot of curb.

Reliable estimates of the cost of constructing an integral curb and gutter, by using one manufacturer's curb and gutter machine, are \$1.25 to \$1.50 per foot, as compared to \$2.00 to \$3.00 per foot using hand labor and forms.

Of special interest is the "offset" model of curber, which lays the curb right out to the edge of the existing pavement, eliminating the waste of any of the pavement area.

We believe that the automatic curber is one of the machines that has done a great deal to increase the use of asphaltic concrete.

THE END

Case history

Small tractor, disk speed roof repairs

An unusual application for a small wheel tractor and disk was discovered by the A. E. Staley Mfg. Co., Decatur, Ill., when the company set about removing several layers of old asphalt roofing from its large plant.

Crews of laborers had hardly begun the laborious job, working with picks and shovels, when someone came up with the idea of renting an International Cub Lo-Boy tractor and a disk to do the job.

The tractor, weighing about 1,200



pounds and packing better than 10 hp, was hoisted the 100 feet to the rooftop by one of the company's

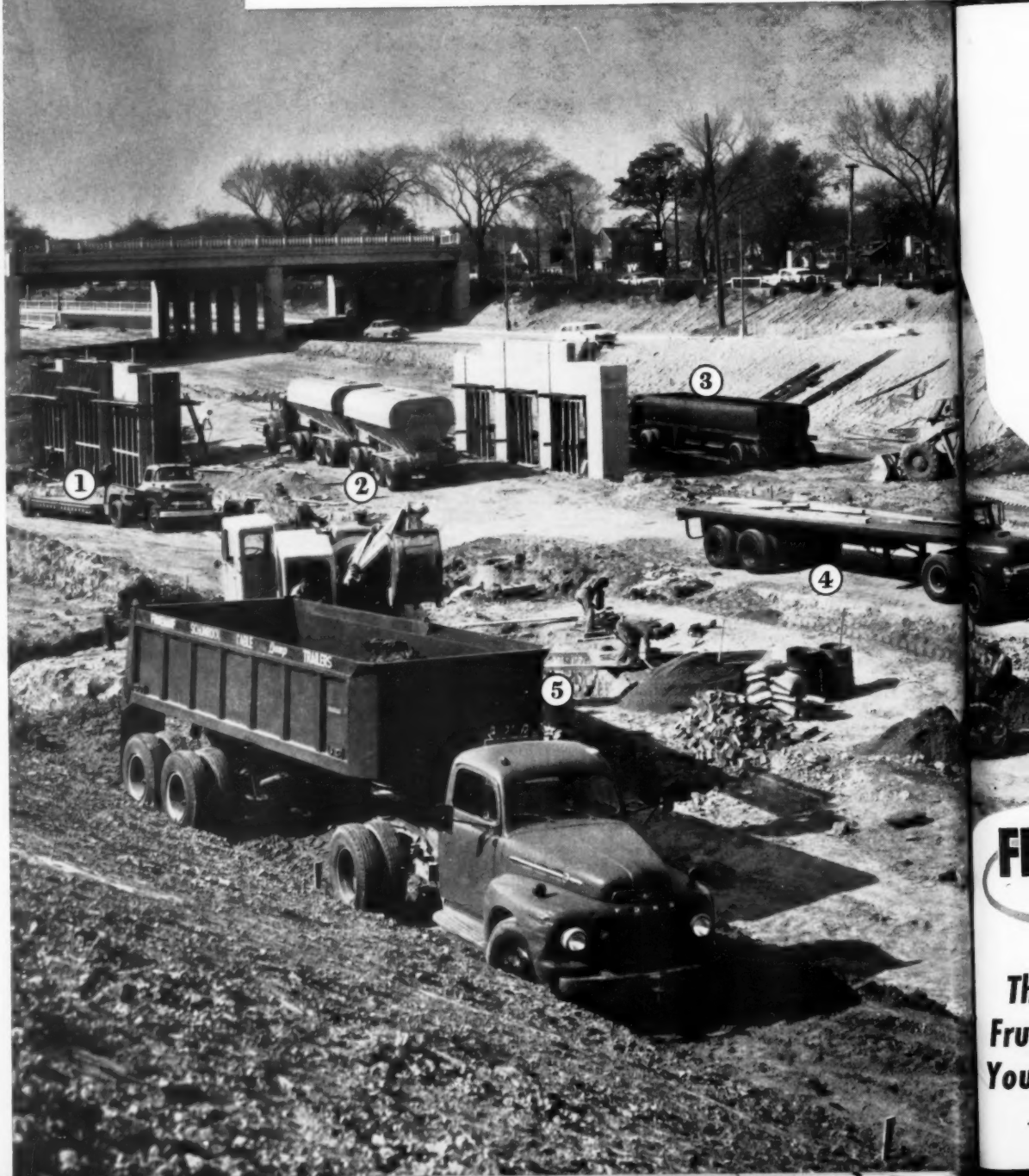
cranes. As the tractor-drawn disk loosened the old roofing, waste material was shoveled over the side and the new roof put down.

What promised to be a long job of hand pick-and-shovel work was completed in less than two weeks' time after the manufacturing company mechanized its roof repair operation.

For further information about International tractors write to the International Harvester Co., Dept. C&E, 180 N. Michigan Ave., Chicago 1, Ill., or use the Request Card at page 18.

Circle No. 36.

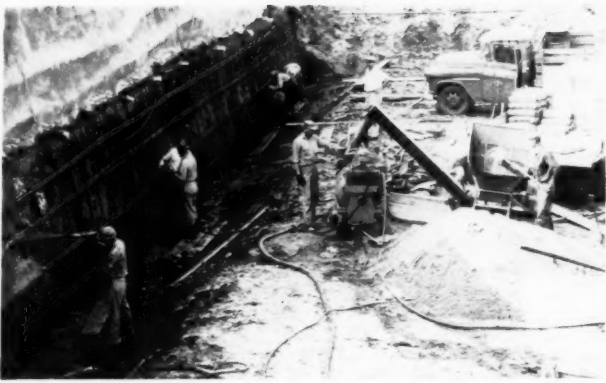
all the roadbuilding and in ONE



Using Tr
ing wall

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You



Using True Gun-All equipment, workmen apply a 3-inch concrete stabilizing wall to a cutoff bank.

Case history

Gunned concrete shaves bank stabilization cost

Use of gunned concrete to stabilize a cutoff bank adjacent to the site of a new six-story building resulted in savings estimated by the contractor at more than \$17,000.

The concrete was used for the stabilization instead of steel piles, which it is estimated would have cost about \$25,000. Instead, the gunned concrete job came to less than \$8,000.

The walls of the bank were core-drilled, and expansion anchors on the ends of steel rods were placed in the

holes. Wet sand was blown into the holes with True Gun-All machinery. Finally, a 3-inch-thick reinforced concrete wall applied with the same Gun-All machinery was placed.

For more information about True Gun-All equipment and applications of this gunned concrete process, write to the True Gun-All Equipment Corp., Dept. C&E, P. O. Box 2526, Tulsa, Okla.

Circle No. 226.

Case history

Wire rope splicer makes tough job easy

The George D. Auchter Co., Jacksonville, Fla., contractor, uses three Quay Torquemasters for speedy, inexpensive splicing of wire rope on its construction machinery and projects. The firm finds that the Torquemaster's ability to overcome wire rope torque and the fact that the average worker can operate the splicer make it an ideal tool for a variety of wire rope modifications.

What was formerly a slow and difficult process has now become a simple operation with the Torquemaster. In making an eye splice in $\frac{3}{4}$ -inch rope, for example, the standing part of the wire is held by a machinist's vice, and the bitter or short end is bent around a thimble and placed between the jaws of the Torquemaster. The thimble block runs forward against the head of the eye. A workman counter-rotates the jaw assembly against the lay of the rope to overcome the torque, then dogs it down by means of a brake located in the base of the machine.

The bitter or short ends are then unlaid, and three of the strands are run through the standing part of the cable. A few more tucks and the ends are ready to be clipped off. The sling is thus ready for use after only a few minutes' work.

For further information about the Torquemaster, write to Quay Industries, Dept. C&E, 2135 Riverside Ave., Jacksonville 4, Fla.

Circle No. 102.



A mechanic for The George D. Auchter Co. sets up a $\frac{3}{4}$ -inch wire rope in the Quay Torquemaster.

ng transportation you need Great trailer line!

Movers of roadbuilding materials and machinery have several very important reasons for investing in Fruehauf-built equipment.

- ★ Fruehaufs are engineered for the top payloads and efficiency.
- ★ Fruehaufs are designed simply, for economy in price and upkeep.
- ★ Fruehaufs never become "orphans"—they're backed up by service.
- ★ Fruehaufs of most types are ready for delivery right now.
- ★ Fruehaufs earn extra profits for extra years.

Five different high-capacity, moneymaking Fruehauf Trailers are shown left on the scene of a current roadbuilding project. (1) is a Removable Gooseneck Carryall which permits front end loading and unloading, cuts unloading time of heavy cranes and shovels to less than 15 minutes, and requires no winch with capacities up to 50 tons. (2) is an Airlide® Bulk Cement Tank train, a rapidly-discharging unit noted for the simplicity and economy of its gravity-type unloading mechanism. (3) is a Hopper-Type Dump, one of a variety of rugged, specially designed units, with capacities up to 14 cubic yards, to haul such materials as sand, crushed stone, bulk cement, and other aggregates. (4) is a heavy duty Platform Trailer for machinery and heavy building materials, ruggedly designed for "plus" payloads. (5) is a Fruehauf-Schonrock Cable Dump, profitable because of its extremely light weight which permits payload bonuses of up to 4,000 pounds.

*Trademark—Fuller Co.

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For more facts, use coupon, or Request Card at page 18 and circle No. 378

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for 0**

**Buy your job-sized
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complete line of
profit-producing rigs.**

Now—why tie-up useful money or “strap” your credit by “over-equipping”? Why spend upwards of four times as much for several limited-duty machines which one 4-In-1 can replace—and outproduce?

An International Drott 4-In-1 gives you 4-machine usefulness for one moderate investment. Yes, the exclusive and revolutionary 4-In-1 gives you instant availability of 4 big-capacity machine actions!

You get world-beating Skid-Shovel excavating-

All-in-1 International Drott 4-In-1

“Carry-type scraper”

with “see-easiness” of front-mounting—
to grade, strip, spread, or compact with
amazing, inch-close accuracy!



Skid-Shovel...

with Drott's exclusive, “concrete-smash-
ing,” triple-power pry-action break-out—
and 42° ground-level bucket roll-back!



4-machine job-capacity or One-machine price!

loading performance. You get exclusive multi-purpose "carry-type scraper" action. You get production-boosting clamshell action. You get "radius-controlled" bulldozer action with big-yardage earth-rolling ability!

You get 4-In-1 versatility unlimited for a fraction of the price of the machines it can replace and outperform, on job after profitable job!

And you can have 4-In-1 advantages teamed with all-condition International crawler traction, or rubber-

tired Hough Payloader speed!

See your *International Distributor*—he's the only one who can offer you a 4-In-1 deal! He's the only one who can save you the thousands of dollars that 4-In-1 ownership assures—by giving 4-machine utility for one moderate investment. And he can prove the "heap of difference" in 4-In-1 performance on tracks or rubber—against anything else in the field! See him soon for a demonstration!

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Clamshell...

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Bulldozer...

with clam lip up, and skid shoes on the ground, the radius-controlled blade rolls the earth with precision!



**ONLY YOUR
International distributor
CAN OFFER THESE
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**Here's
job-range...**



Exclusive triple-power pry-action break-out

Inbuilt ability to deliver tremendous excavating force enables this TD-9 4-In-1 to yank out deeply embedded old masonry piers. You see typical, on-the-job advantages of true and exclusive International Drott pry-over-shoe break-out action—the only design that gives you the three absolute essentials: (1) Full hydraulic power transfer from full piston-face power-push; (2) Long lever to apply full pry-power; (3) Fixed fulcrum of frame-mounted skid-shoes, to concentrate pry-force!



Exclusive parallelogram raise action

No eccentric tipping to cause spill-back and lose yardage! The 4-In-1 has non-spill, roll-back level—all the way up. Compared to ordinary front-end loader performance, this feature, alone, can increase your daily yardage up to 18%! You can bottom-dump the 4-In-1 as a clamshell...and do it 2½-foot higher than ordinary roll-forward buckets. And bottom dumping eliminates the sticky materials problem—where other rigs foul up and can't get the job done!

Check these other famous International Drott Exclusives!

① **STANDARD EQUIPMENT.** Three-valve design, to provide hydraulic control power for attachments.

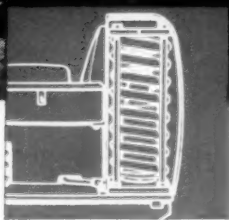
② **STANDARD EQUIPMENT.** Double-bottom, bridge-truss bucket to insure 4-In-1 strength to match pry-action.

③ **STANDARD EQUIPMENT.** Yoke-type supports to insure linkage strength to back 4-In-1 capacity!

④ **STANDARD EQUIPMENT.** Magnetized dip stick to prevent damage to hydraulic system from minute abrasives!

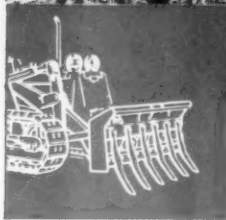
Only your International Distributor can offer you the big money-making advantages of International Drott exclusive 4-In-1 features. Only he can deliver you job versatility unlimited, in the world's only multi-purpose machine of its type! Prove to yourself that your correct size of 4-In-1 can replace and outperform a whole machinery yard full of limited-duty rigs. Ask for a demonstration!

's where 4-in-1 gets world-beating
 e... capacity... stay-put performance!



Exclusive shock-swallowing Hydro-Spring

Capacity-boosting, machine-protecting Hydro-Spring is a hydraulic cylinder enclosed in a heavy-duty locomotive-type coil spring. Shock force displaces oil from main lift cylinders into the Hydro-Spring cylinder—extending it and compressing the big spring to absorb and cushion impact loads. Slamming the 4-In-1 bucket into hard material—dozing frozen ground—dumping rock with a bang—you never worry! Hydro-Spring gentles trouble-causing forces by two-thirds or more—practically eliminates hydraulic hose failures!



Complete line of attachments

Job-getting, money-making attachments built for specialized duty, provide tree-grubbing, boulder-bucking, log-loading performance available only from International Drott equipment! Grubber Blade attachment, used in place of the 4-In-1, is shown applying the tremendous force of pry-action break-out—to uproot a tough old oak tree. Other special attachments built to extend International Drott advantages to other fields include: Rock Forks, Skid-Grapples®, Bulldozer and Bullangledozer blades!

CHOOSE FROM

four 4-in-1 sizes

TRACTOR SIZE	4-IN-1 CAPACITY
TD-6	1-YARD
TD-9	1½-YARD
TD-14	2¼-YARD
TD-18	3-YARD



International Harvester Company, 180 N. Michigan Ave., Chicago 1, Ill.
 Drott Manufacturing Corp., 3126 South 27th St., Milwaukee 15, Wis.

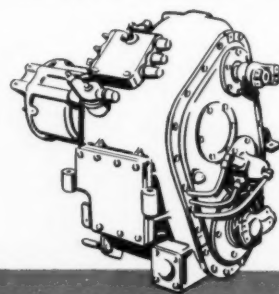
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ONLY
your International distributor
can give you 4-in-1 Performance
ON RUBBER!



NO-STOP POWER SHIFT



One lever makes all shifts forward and reverse under full throttle — no clutching, no stopping. Torque converter provides infinite speed ratios.

PAYLOADER[®] mobility

PLUS four-machine utility

The only rubber-tired tractor-shovels available with Drott 4-in-1 buckets

Now you get even more tractor-shovel performance when you buy a "PAYLOADER". Equipped with a Drott 4-in-1 bucket, your "PAYLOADER" can handle many jobs that other wheeled tractor-shovels can't touch . . . perform shovel, clamshell, scraper or bulldozer work that would otherwise require several separate machines.

With a Drott 4-in-1 on a "PAYLOADER" you also get:

MOBILITY — quick-to-job travel over streets or highways under its own power . . . ability to work on or off paved surfaces.

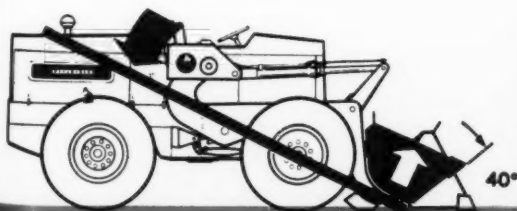
MANEUVERABILITY — easy operation and fast

loading cycles because of responsive rear-wheel power steering, "no-stop" finger-tip power shifting, dependable 4-wheel power brakes.

BALANCE AND STABILITY — long wheelbase . . . hydraulic load-shock-absorber . . . low, close bucket-carry position, all contribute to the easier riding qualities, the higher carrying speeds and the unusual balance that are outstanding "PAYLOADER" operating advantages.

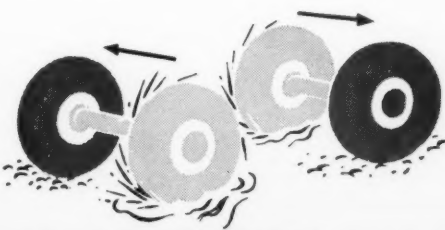
TRACTION AND DIGGING POWER — exclusive power-transfer differentials, planetary final drives and the powerful pry-out bucket digging action help these "PAYLOADER" units to outperform other tractor-shovels of comparable size. Your International Distributor is anxious to demonstrate what these "PAYLOADER" tractor-shovels with a Drott 4-in-1 bucket can do for you. Ask him about the "PAYLOADER" Deferred Payment Plan.

PRY-OUT DIGGING ACTION



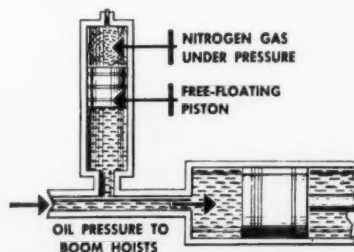
Exclusive "PAYLOADER" bucket action combines a powerful prying force over "break-out" pads, with 40° bucket tip-back at ground level to get heaped loads into bucket quickly and easily.

POWER-TRANSFER DIFFERENTIALS



These special differentials give better traction under all conditions — automatically deliver 25% more power to the wheels with the better traction.

LOAD SHOCK ABSORBER



This important device is a part of the hydraulic system. It cushions the loaded bucket, smooths the ride, permits faster carrying speeds, reduces spillage, boosts production.

All three sizes of 4-wheel-drive "PAYLOADER" tractor-shovels, models HU, HH and HO, are available with Drott 4-in-1 buckets, sizes 1, 1½ and 2¼ cu. yd. respectively.



PAYLOADER[®]

MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY



For more facts, use coupon or Request Card at page 18 and circle No. 381

THE FRANK G. HOUGH CO.

762 Sunnyside Ave., Libertyville, Ill.

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The Drott four-in-one



The Tractor-shovel comes of age

*Five years of constant improvement give this earthmover
the power to tackle almost any digging and loading job*

by FRANK KYPREOS, Director of Research

There's no need to gamble when you can bet on a sure thing!

DROP BLOCK . . . medium weight, with cast iron check weights, swivel hooks . . . numerous sheave sizes and capacities

HI-LIFT CRANE BLOCK, short overall length, flame hardened steel sheaves, hi-speed bronze bushings or roller bearings. One to three sheaves . . . 15 to 60 ton capacity.

S-T-R-E-A-M-L-I-N-E-D Crane Block. All-steel construction. Extra heavy outer plates. 14"-18"-24" diameter sheaves. One to five sheaves, 100 ton capacity.

A Better **CONSTRUCTION BLOCK** *For Every Purpose*

Illustrated above, three of many types and sizes of McKissick's Better Blocks. Designed to meet the needs of construction men who require superior quality and efficient operation. All sizes and capacities to meet special requirements. Write for complete catalog.

McKISSICK

McKISSICK PRODUCTS CORPORATION
Box 2496 Tulsa, Oklahoma

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Some of the most spectacular competition the construction industry has ever seen has kept tractor-shovel manufacturers busy improving their equipment—all to the ultimate benefit of the contractor.

In the last five years, the competitive race in this field has produced equipment with new power features, bigger capacities, more speed, more mobility, and easier maintenance. The result: the modern combination earthmover-material handling machine that is variously known as the tractor-shovel, tractor-loader, front-end loader, shovel-loader, or unit loader.

Here is a roundup of 1952-1957 advances—in both operating efficiency and ease of maintenance—as reported by major manufacturers:

The Hough Payloaders

The Payloaders come in six gasoline or diesel-powered models with four-wheel, rear-wheel, or front-wheel drive, and front or rear-wheel



The Hough HO Payloader

steer. The most familiar to contractors are the four-wheel-drive units which are all-around machines for excavating, earthmoving, and bulk-material handling.

The largest of these, the Model HO, has a bucket capacity of 2 1/4 cubic yards. This rugged excavator with a powerful pry-out force has 40 degrees of bucket tip-back at ground level. A hydraulic shock-absorber takes some of the load-impact strain off the Payloader and reduces spilling on the run. The unit shifts into any of six speeds without stopping.

All Payloaders are equipped with torque-converters, torque-proportioning differential, complete power-shift

CONTRACTORS AND ENGINEERS

transmission, and planetary axles.

One important maintenance advance has been the elimination of the dry-type spring-loaded master clutch made possible by the adoption of the power-shift transmission using hydraulic clutches. Other easy-maintenance features include a pressurized hydraulic reservoir to decrease "breathing" due to rod displacement.

Hough is now field testing the new HS Payloader, which takes a 2½ to 7-cubic-yards bucket for materials ranging from 6,000 pounds to 2,000 pounds per cubic yard. It is powered by a 250-hp Cummins diesel.

Clark's Michigan Line

The Michigan line of tractor-shovels consists of eight rubber-tire machines ranging in capacity from 16 cubic feet through 6 cubic yards of the big Model 375A, which is driven by a 375-hp engine. Clark Manufacturing Co. introduced this line early in 1954 and owes part of its success to the fact that it entered the market with units complete with torque-converters, power-shift transmissions, and planetary wheel-drive axles as standard equipment on all models. The use of the torque-converter and power shift transmission made it possible to eliminate the foot clutch—one source of trouble—and to advance operating ease and general efficiency.

Clark points out that the planetary axles used relieve the axle shaft of 70 per cent of the normal torque. Axle breakage from this source is about eliminated. As to other maintenance features, the power shift transmission selector clutches run in oil outside the transmission case and can be serviced by merely removing a cover cap. Another time-saving feature is that the four major components of the Michigan power train are designed so that they can be disassembled and removed individually for faster bench servicing.

International-Drott Skid-Shovels

Drott's biggest innovation since 1952 has been the Four-in-One bucket, which superseded the standard bucket on all models (although the regular bucket is still available). This is a unique two-segment bucket. Each segment is hydraulically manipulated to alter the shape of the bucket in one of four ways. The Four-in-One's front and back portion, held closely together, make an ordinary digging and loading bucket. With the forepiece slightly raised, the bucket becomes a bullclam, which performs a scraper-like operation as the machine moves forward. The front piece then clamps over a full bucket to lift, and opens again to dump. With both pieces fully swung out, the bucket resembles a clamshell and performs in a similar way. The forepiece swung up and out of the way leaves the back piece to work alone as a bulldozer.

The Drott Four-in-One, like other Skid-Shovels, is designed for International Harvester crawler tractors. Skid-Shovels have such features as the Hydro-Spring to cushion impact loads, 42-degree ground-level tip back, prying break-out, level-lift, power-

(Continued on next page)

For more facts, circle No. 383→

The new Michigan 375A

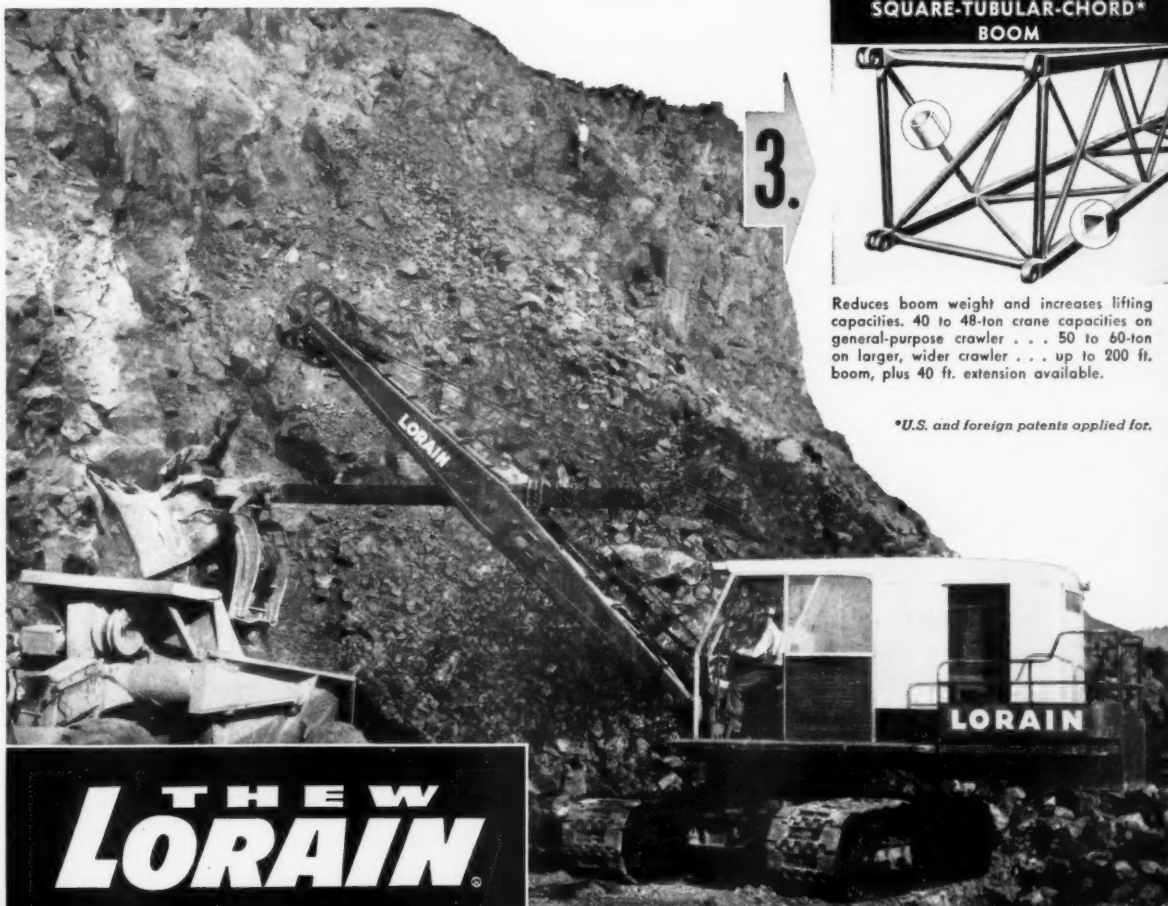


the **BIG 3** puts the 2½-yd. LORAIN-85A years ahead!

These 3 big features will mean more to you in profits than anything you can find in any other 2½-yd. shovel-crane. They mean greater operating ease, longer life, increased crane capacities and reduced maintenance. Of course, there are many more features in the Lorain-85A . . . torque converter power-take-off, new "operator designed" cab, full air controls of all crawler operations, removable counterweight, are but a few. The Lorain-85A is years ahead in the important features that will put you 'way ahead in profits.

Be sure you know all about the "85A" . . . your Thew-Lorain Distributor will explain every detail!

THE THEW SHOVEL CO. Lorain, Ohio



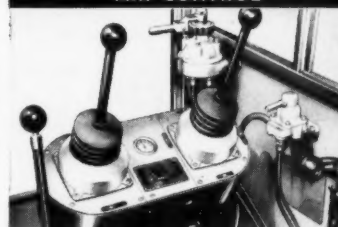
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"SHEAR-BALL"™ TURNTABLE MOUNTING



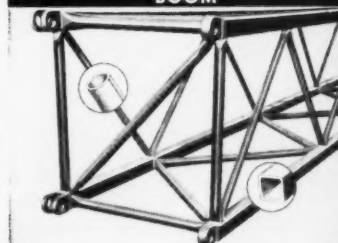
Turntable is secured to crawler and revolves easily and freely on a huge "ball bearing." No center pin or nut, centering gudgeon or exposed roller path . . . no turntable rollers . . . no constant adjustment, maintenance or lubrication problems.

2-LEVER, "JOY-STICK" AIR CONTROL



The newest of all shovel-crane power controls. "Metered Air" feeds power to clutches at any rate desired — yet operator retains full "feel" of all operations. Fewer levers, fewer motions, faster, smoother, less effort, less fatigue.

SQUARE-TUBULAR-CHORD* BOOM



Reduces boom weight and increases lifting capacities. 40 to 48-ton crane capacities on general-purpose crawler . . . 50 to 60-ton on larger, wider crawler . . . up to 200 ft. boom, plus 40 ft. extension available.

*U.S. and foreign patents applied for.

(Continued from preceding page)

stroke cylinder action, closed hydraulic system, and one lever control. The standard bucket is available in 1 to 3 yard capacities.

Caterpillar Traxcavators

Powered by Caterpillar diesel engines that produce 50, 70, and 100 horsepower at the flywheel, respectively, the Cat 933, 955, and 977 easily handle their 1, 1½ and 2¼-yard loads. Traxcavators have seen some 30 improvements in the last five years. Some of the more important ones are: oil-type clutch (introduced in 1954, still a Caterpillar exclusive); triple-grouser track shoe; full-flow filter of all hydraulic oil; tilt-back bucket linkage; in-seat starting of gasoline starting engine; direct electric starting of diesel engine; automatic bucket "kick-out"; optional track arrangements, and, very recently, an automatic bucket positioner or leveler.

Chief among the maintenance features is the oil-type clutch, which is said to extend the adjustment period from 4 to 10 times. Periodic lubrication of clutch bearings is unnecessary.

Caterpillar has just introduced a new hydraulic bucket that tilts 60 degrees to dump to one side. This permits the Traxcavators to do in-line loading, eliminating the constant



The new side-discharge Traxcavator

turning of the dig-and-load cycle. This feature also lowers wear on track, track parts, steering and master clutches, and idlers that results from constant turning.

Allis-Chalmers

Allis-Chalmers has four crawler-mounted tractor-shovels in its line ranging from 1½ to 4 cubic yards in capacity. These are the joint product of Allis-Chalmers and Tractomotive Corp.

Working in terms of an integral

unit, these companies produce a balanced loader with correct weight distribution. Bucket capacities match the size and engine power of the particular models for operating efficiency and long service life. Allis-Chalmers diesel engines power all models. Torque-converter drive is standard in the 3 and 4-yard models. Integral design has meant the elimination of excessively heavy mounting frames.

An important maintenance feature is the hydraulic system. This has a special tank that has lines, connections, manifolding, a three-way filtering system, and three safety valves inside to protect against leaks.

Another maintenance feature of Allis-Chalmers units is the 1,000-hour lubrication of track wheels, rollers, idlers, sprockets, and every lubrication point in the track mechanism. This is calculated to save at least 30 minutes servicing time per unit each day.

Tractomotive Tracto-Loaders

Tractomotive makes five models of its rubber-tired Tracto-Loaders, the largest of which, the TL-20D, has a two-cubic-yard bucket. Assisted by an Allison Torqmatic power-shift transmission, the operator on the TL-20D can shift to any of three speeds, in either forward or reverse and under full power, by using just one lever.

Power brakes, power steering, and planetary axles with ring gear in addition to the sun gear are added features. The axles are connected to the welded frame by 2-inch-diameter pins rather than the usual U-bolts.

The four other Tracto-Loader models feature a combination torque converter and clutch-type transmission that uses two clutches. One is a forward clutch and the other a reverse. After choosing the most suitable of four gears provided, the operator merely pushes the clutch lever forward for forward travel or pulls it back for reverse. No other hand or foot operations are needed. Since only one of the two clutches is engaged at any one time, the other can cool, prolonging service life.

In all gear ranges the reverse speeds are 1.6 times as fast as the forward speeds. In effect this amounts to two speed ranges for each gear; low range in forward travel or while loading and high range for getting away fast from the pile or bank with the load.

Pettibone-Mulliken Speedalls

Pettibone-Mulliken's diesel-powered Model 250 heads a line of Speedalls ranging in capacity from 1½ to 3¼ cubic yards. An Allison torque converter matches power to load, tends to eliminate stalling, improves traction, and protects against engine

B.F. Goodrich on-the-job

ANY TIRE!
ANY JOB!
ANYWHERE!

WE'RE as close as your phone! No matter how big the tire, how intricate the equipment, how complicated the repair job, we can handle it quickly, expertly. Our B.F. Goodrich Tire Service Men are trained for the specialized task of on-the-job tire service. And they know how to save you money on tires too. Without cost or obligation your BFG man will:

- **Inspect all your tires.**
- **Point out tires** that should be repaired or replaced.
- **Select tires** for retreading by factory-tested and proved B.F. Goodrich methods.
- **Set up** a proper inflation program.
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Save the expense of unnecessary tire failures, the cost of work-stopping down-time. Call us for B.F. Goodrich on-the-job tire service!

B.F. Goodrich Servicemobiles are fully equipped

They have hydraulic crane, pneumatic wrenches, bead jacks and all of the latest power tools and devices for speedy, efficient tire service on the job.



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See us for B.F. Goodrich off-the-road tires and service or check Yellow Pages of phone book for more complete listing in your area

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The new 6-cubic-yard Scoopmobile

overloading. Other advances during the last five years have included power-shift transmission, planetary axles, power steering, and power brakes. Speedalls also have a hydraulic accumulator to cushion shock-loads and a bucket leveling device.

Aerogrip hydraulic hose couplings allow hose repairs to be made right in the field. If the failure is near a coupling, repair is only a matter of cutting the hose at the break and replacing it in the same fitting. All operating parts on the Speedalls are protected from loose materials, reducing maintenance.

Yale & Towne Trojan Loadster

This famous tractor-shovel is now available from Yale & Towne Manu-

facturing Co. Contractors Machinery Co. will continue to produce the tractor as a subsidiary company.

Trojan Loadsters are available in 1 1/4 and 2-cubic-yard models. They feature 4-wheel drive and an Allison Torqmatic transmission. The Torqmatic gives the Loadster hydraulic shifting in full travel with split-second speed selection. There is also a selector lever for 2 or 4-wheel drive.

Other modern features are reverse-curve safety arms, fingertip controls, straight-line horizontal thrust, independent bucket action, and a low load-carrying position.

Scoopmobile

Mixermobile Manufacturers has recently announced a 6-cubic yard trac-

tor-shovel delivering a break-out force of 35,000 pounds and with a working capacity of 25,000 pounds. Torque converter, power shift, full reversing transmission, power steering, four-wheel planetary drive, and a roll-out high-discharge bucket with a variable discharge height are all found on the Model LD20AD.

Other features, typical of all Scoopmobiles, are two-axle oscillation, center-pin coupling, non-rigid frame, interchangeable axles, and lateral bucket spotting.

Eimco's new front-end loader

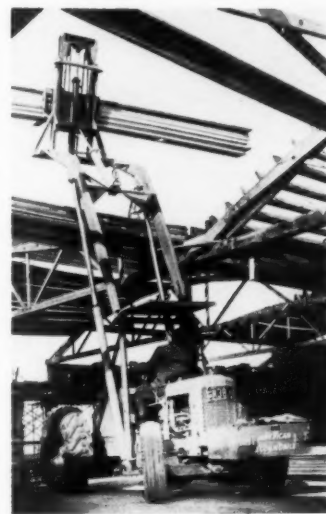
A new unit in the Eimco line, the 105 front-end loader, gives Eimco owners new operating flexibility. Whereas headroom clearance is sometimes insufficient to let Eimco's standard overhead-loading 105 tractor-excavator load, the new front-end loader will operate in 9-foot 6-inch headroom. It will also make loading easier when the trucks are higher than the loader, or when digging off high banks. Although the top dumping height is 11 feet 6 inches, a high pivot point on the bucket makes it possible to reach over a bin or hopper 14 feet high.

The Eimco features independent track reversal for spin turns. Other advances are a torque converter and Uni-drive transmission.

Close cousins

Two units that should be discussed along with the integral-type tractor shovels are the Econmobile and the Dempster Diggster. Both are modifications of the tractor-mounted shovel along specialized lines.

Strictly speaking, the Econmobile cannot be called a front-end loader, although it does come with a 15-cubic foot bucket. Its manufacturer, American Road Equipment Co., calls



The Econmobile

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JUNiper 5-4141
84
5-5454

LOUISIANA
BATON ROUGE—B. F. Goodrich Store
MONROE—B. F. Goodrich Store
NEW ORLEANS—B. F. Goodrich Store

2-6895
3-0386
CAnal 0191

MAINE
LEWISTON—B. F. Goodrich Store

2-9851

MARYLAND
BALTIMORE—B. F. Goodrich Store
HAGERSTOWN—B. F. Goodrich Store
SALISBURY—B. F. Goodrich Store

BEImont 5-9054
REgent 9-4760
Pioneer 2-2172

MASSACHUSETTS
BOSTON—Merchants Distributors, Inc.
BROCKTON—B. F. Goodrich Store
LYNN—B. F. Goodrich Store
NEW BEDFORD—B. F. Goodrich Store
NORTH ADAMS—B. F. Goodrich Store
SPRINGFIELD—B. F. Goodrich Store
W. SOMERVILLE—B. F. Goodrich Store
WORCESTER—B. F. Goodrich Store

KENmore 6-4780
100
2-0297
2-0275
MOhawk 3-6849
REpubl 3-6666
PRespect 6-4469
PLEasant 5-4397

MICHIGAN
DEARBORN—B. F. Goodrich Store
DETROIT—B. F. Goodrich Store
FLINT—B. F. Goodrich Store
GRAND RAPIDS—B. F. Goodrich Store
KALAMAZOO—B. F. Goodrich Store
LANSING—B. F. Goodrich Store
PONTIAC—B. F. Goodrich Store
SAGINAW—B. F. Goodrich Store

LUzon 1-6900
FOrrest 6-4900
CEDar 2-0169
GLendale 3-3444
Firestone 3-2544
IVanhoe 2-0621
FEderal 2-0121
PLEasant 2-4101

MINNESOTA
AUSTIN—B. F. Goodrich Store
DULUTH—B. F. Goodrich Store
MINNEAPOLIS—B. F. Goodrich Store
ST. PAUL—B. F. Goodrich Store

HEImock 7-3834
RANdolph 4-8505
FR 5-1195
CApitol 2-3817

MISSISSIPPI
COLUMBUS—B. F. Goodrich Store
CORINTH—B. F. Goodrich Store
GREENVILLE—Bryan Wilson Tire Co.
GREENWOOD—B. F. Goodrich Store
JACKSON—B. F. Goodrich Store
MERIDIAN—B. F. Goodrich Store
NATCHEZ—B. F. Goodrich Store
YAZOO CITY—B. F. Goodrich Store

FAIRfax 8-7150
6829
2-1543
70
2-0846
2-3128
2-1651
2164

MISSOURI
CARUTHERSVILLE—B. F. Goodrich Store
HANNIBAL—B. F. Goodrich Store
JOPLIN—B. F. Goodrich Store
KANSAS CITY—B. F. Goodrich Store
KANSAS CITY—Missouri Valley Tire Co.

15
138
MAYfair 4-4141
VALEntine 2-4777
BALtimore 1-1184

MEXICO
POPLAR BLUFF—J. A. Parker Tire Co.
ST. CHARLES—B. F. Goodrich Store
ST. LOUIS—B. F. Goodrich Store
SPRINGFIELD—B. F. Goodrich Store

SUNset 5-3338
RANdolph 4-3646
FOrrest 4-9300
4-2561

NEBRASKA
OMAHA—B. F. Goodrich Store

JACKSON 4024

NEW JERSEY
NEWARK—B. F. Goodrich Store
PATerson—Dave Tire Co.
PERTH AMBOY—Jersey Tire Co.

MARKet 3-4346
AFFmory 4-6033
VALley 6-2300

NEW MEXICO
ALBUQUERQUE—B. F. Goodrich Store
CARLSBAD—B. F. Goodrich Store
GALLUP—B. F. Goodrich Store
SANTE FE—B. F. Goodrich Store

3-5587
UNION 3-3141
3-0305

NEW YORK
ALBANY—B. F. Goodrich Store
BRONX—B. F. Goodrich Store
LONG ISLAND CITY—B. F. Goodrich Store
MASSENA—B. F. Goodrich Store
NEW YORK—B. F. Goodrich Store
POUGHKEEPSIE—B. F. Goodrich Store
SCHENECTADY—B. F. Goodrich Store
SYRACUSE—B. F. Goodrich Store
UTICA—B. F. Goodrich Store

4-8115
5-3622
ASTORIA 8-6566
ROCKwell 8-3541
ENDicott 2-0900
GLOBE 2-9030
DICKens 6-4282
74-5351
3-7536

NORTH CAROLINA
ASHEVILLE—B. F. Goodrich Store
CHARLOTTE—B. F. Goodrich Store
DURHAM—Nu-Tread Tire Co.
FAVETTEVILLE—B. F. Goodrich Store
GREENSBORO—B. F. Goodrich Store
RALEIGH—B. F. Goodrich Store

3-2726
EDISON 3-4134
9-2087
2-2458
2-3197
3-3831

OHIO
CINCINNATI—B. F. Goodrich Store
CLEVELAND—B. F. Goodrich Store
ELYRIA—B. F. Goodrich Store
HAMILTON—B. F. Goodrich Store
MANSFIELD—B. F. Goodrich Store
MARIETTA—B. F. Goodrich Store
TOLEDO—B. F. Goodrich Store
WOOSTER—Strock's Tire Company

CHerry 1-4050
PRespect 1-2650
2552 or 2955
TWINbrook 3-4711
4500-8
FRontier 3-2086
CHerry 3-1258
HOWard 2-6908

OKLAHOMA
MIAMI—Miami Sales Company
OKLAHOMA CITY—B. F. Goodrich Store
TULSA—B. F. Goodrich Store
TULSA—Tom P. McDermott, Inc.

KIMball 2-2888
FOrrest 5-1347
LUther 5-1221
DIAMond 3-9188

OREGON
EUGENE—B. F. Goodrich Store

DIAMond 5-6141

PORTLAND—Mel Goodin Tire Co.
PORTLAND—B. F. Goodrich Store
SALEM—Russell's Tire Service

BEImont 5-4127
BEImont 6-2106
EMpire 2-5651

PENNSYLVANIA
CLEARFIELD—J. B. Beard
ERIE—B. F. Goodrich Store
HARRISBURG—B. F. Goodrich Store
HOMETOWN—Schultz
JOHNSTOWN—McNally Tire & Rubber Co.
LANCASTER—B. F. Goodrich Store
PITTSBURGH—B. F. Goodrich Store
READING—B. F. Goodrich Store
SCRANTON—Kelly Smertz
TURTLE CREEK—B. F. Goodrich Store
WILKES-BARRE—Economy Gas & Oil
YORK—L. J. Allen

5-9644
2-3205
CEDar 4-6296
TAMaqua 2300
5-4321
EXpress 2-2196
MUSEum 2-8310
4-2274
DIAMond 3-3925
VA 3-2110
VALley 3-6153
5728

RHODE ISLAND
PROVIDENCE—B. F. Goodrich Store

DEXter 1-8600

SOUTH CAROLINA
CHARLESTON—B. F. Goodrich Store
COLUMBIA—B. F. Goodrich Store
FLORENCE—B. F. Goodrich Store
GREENVILLE—Tires, Inc.
SPARTANBURG—B. F. Goodrich Store

2-8391
4-8135
6-4319
5-9657
5491

SOUTH DAKOTA
SIOUX FALLS—B. F. Goodrich Store

4-9979

TENNESSEE
BRISTOL—B. F. Goodrich Store
CHATTANOOGA—B. F. Goodrich Store
CLEVELAND—B. F. Goodrich Store
DYERSBURG—B. F. Goodrich Store
JACKSON—B. F. Goodrich Store
KNOXVILLE—Timley Tire Co.
MEMPHIS—B. F. Goodrich Store
MEMPHIS—Swayne Latham Tires, Inc.
MORRISTOWN—B. F. Goodrich Store
NASHVILLE—B. F. Goodrich Store

4650
AMherst 7-1176
GREENwood 6-4573
ATwater 5-4820
7-8541
5-0286
JACKSON 5-8477
BROADway 5-8121
55
ALPine 5-6353

TEXAS
BRYAN—Brazen Tire Service
CORPUS CHRISTI—B. F. Goodrich Store
DALLAS—B. F. Goodrich Store
EL PASO—B. F. Goodrich Store
FORT WORTH—B. F. Goodrich Store
HARLINGEN—B. F. Goodrich Store
HOUSTON—B. F. Goodrich Store
MARSHALL—Manly's
ODESSA—Odessa Tire & Supply, Inc.
SAN ANTONIO—B. F. Goodrich Store

TAYlor 3-3078
SHIN 4-8841
RIVERSide 1-1201
3-2478
EDison 2-9188
GARfield 3-0330
CApitol 7-9141
5-6776
FEDeral 7-8378
CApitol 7-7278

UTAH
PROVO—B. F. Goodrich Store
SALT LAKE CITY—Frank Ford's Transport Tire Service
SALT LAKE CITY—B. F. Goodrich Store
VERNAL—Superior Tire Service

FRanklin 3-6715
HUNter 5-5711
EMpire 4-7858
445

VERMONT
BURLINGTON—B. F. Goodrich Store

2-3901

VIRGINIA
WINCHESTER—B. F. Goodrich Store

MOhawk 2-0381

WASHINGTON
ABERDEEN—B. F. Goodrich Store
MOSES LAKE—O. K. Rubber Welders
SEATTLE—B. F. Goodrich Store
SPOKANE—B. F. Goodrich Store
TACOMA—B. F. Goodrich Store

276
ROCKwell 5-3303
ELIott 6666
MAIN 5271
MAIN 9173

WEST VIRGINIA
CLARKSBURG—B. F. Goodrich Store
HUNTINGTON—Stettler Tire Co.

MAIN 4-7681
3-0197

WISCONSIN
LA CROSSE—B. F. Goodrich Store

4-4336





The 303 M-H-F Work Bull



The Davis Pit Bull

it an "outdoor fork-lift" that hoists fork attachments, concrete hopper, dozer blade, chain boom, or work platform 22 feet up on bucket arms. There is also a Mortar Hop, a concrete cart on wheels designed to be hoisted by the Econmobile, and a pallet-handling Brick Hop available in two sizes.

The Model 600 lifts 3,000 pounds, reaches 6 feet ahead, and has a speed of 30 mph. It can get in and out of an 8-foot door in carrying position.

Dempster Brothers have a line of tractor-mounted shovels that combine the features of the tractor shovel and the excavator. The "bucket arms" on the Diggster are of unconventional design and provide loading and dumping heights of 13 feet 3 inches (to the bottom of the bucket) and maximum crowd reach of 12 feet 8 inches. Digging buckets with 4 bottom teeth are available in capacities of 1 and 1 1/4 cubic-yard (struck) capacities. These digging buckets are similar in construction to excavator buckets.

The new Nelson Loader

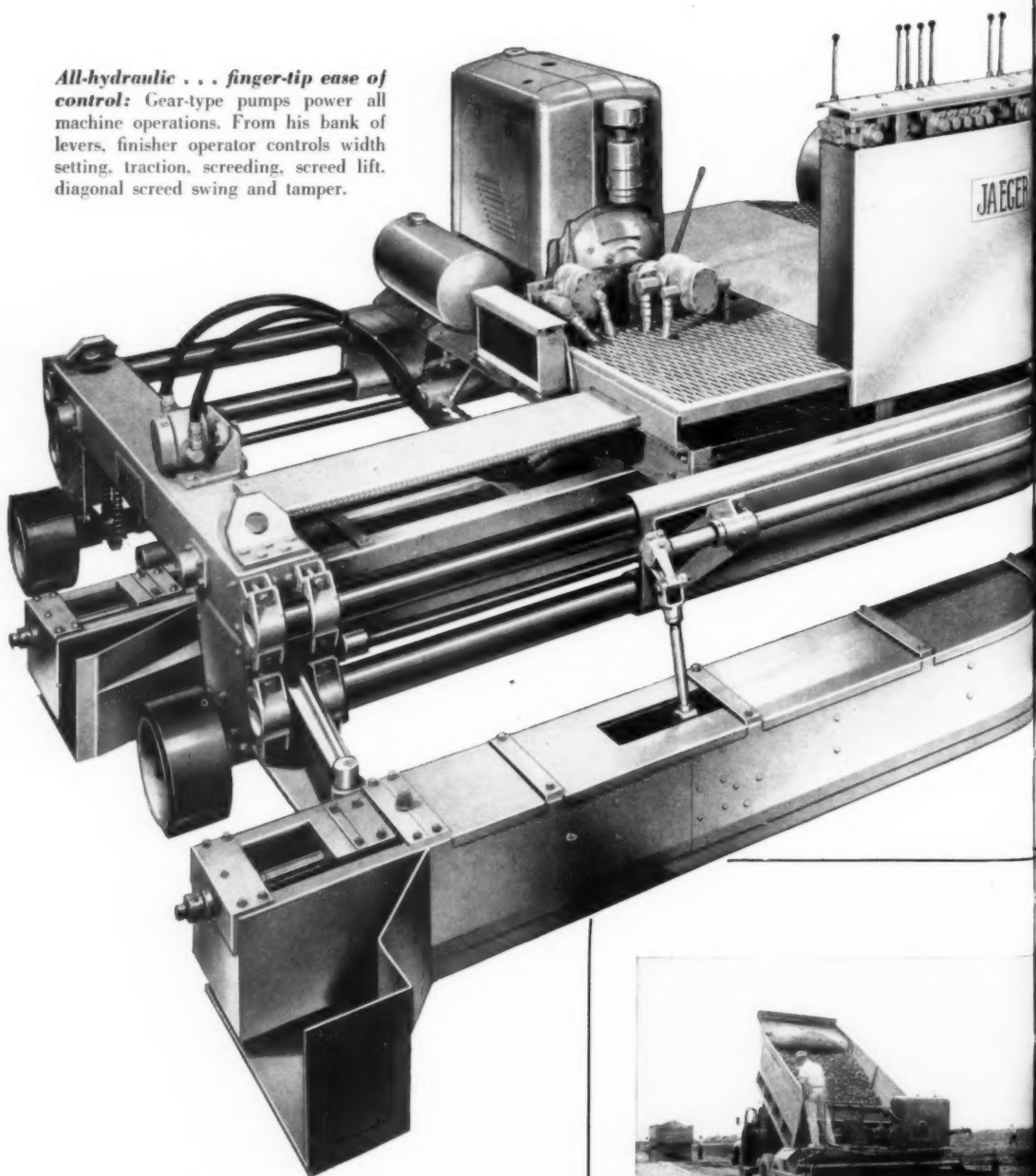
A newcomer to the field is the Nelson Model 200, with a 2-cubic-yard-plus capacity. Scheduled to be in production within the next few months, this unit-type tractor-shovel has all the important features, such as full-reversing automatic transmission and torque converter, four-wheel drive, planetary-type axles, and power steering. It is to be driven by a 117-hp. engine and will have a top road speed of 28.30 mph.

M-H-F work Bulls

The Massey-Harris-Ferguson Work Bull line consists of five light and medium-wheel tractors, and twenty easily interchangeable tractors and attachments have been power matched to Davis loaders of 9 or 11 cubic feet and 5/8 or 3/4 cubic yards. There are twelve other different types of attachments for the Work Bulls, including backhoes with up to 36-inch buckets and fork lifts with up to 4,000-pound capacities.

The feature unit in this line is the Model 500 loader, which is a part of the Work Bulls 303 and 404 machines. Hydraulically-controlled telescoping lift arms raise the bucket to 12 feet

All-hydraulic . . . finger-tip ease of control: Gear-type pumps power all machine operations. From his bank of levers, finisher operator controls width setting, traction, screeding, screed lift, diagonal screed swing and tamper.



6' of infinite width adjustability, with the touch of a lever: Hydraulic power extends telescopic tubular frame as desired, up to 3' on each side—6' in all. A tremendous time and labor-saving advantage on today's work where gradual width changes are increasingly required.



Ideal for laying stone for highway and airport base

8 inches with a dumping height of 8 feet 6 inches.

Davis Pit-Bull

The Davis line includes the Models 101, 102 and 500 loaders developed for the 303 and 404 M-H-F Work-Bulls. The units also fit several other tractors.

The Davis 102 loader features step-in design, hydraulically controlled bucket, and a low box-frame construction that eliminates extra bracing and thereby increases visibility. It is quickly and easily detached. A centralized oil reservoir permits oil to be directed through the pipes or frame of the loader.

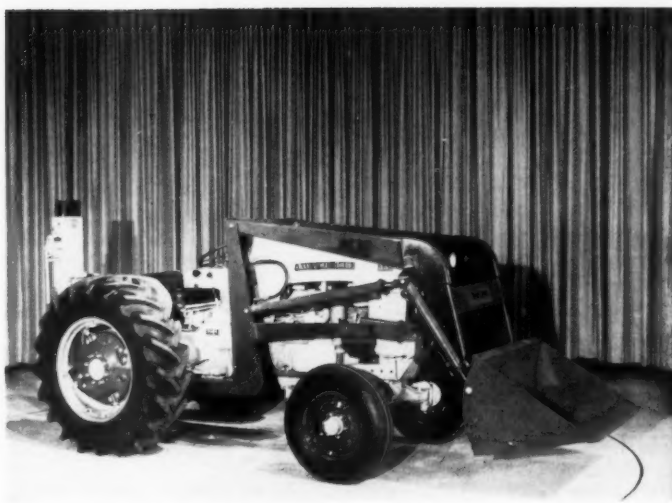
Davis also makes the Pit-Bull. A self-propelled shovel, it features direct-line-thrust digging with low

bucket pivot. This arrangement places more weight on the front drive wheels for better traction. Multiple-disk reversing clutches allow a change of direction by changing foot pedals.

Minneapolis-Moline

This company is preparing to announce a new integrally designed tractor-loader line. The present line is made up of combination units, with a choice of allied equipment that will continue to be available. Three current Minneapolis-Moline models that do efficient tractor-loader duty are the 47-hp. Model 335, the 57-hp. 445 and the 62-hp. Util. The Util. is a prime mover for heavy-duty industrial loaders, and is available in gasoline or diesel models.

Modern features include full-revers-



The MM445 wheeler with bucket

All-hydraulic self-widening Jaeger "JX" Finisher

today's most efficient paving tool

Complete hydraulic operation—Finger-tip control:

Touch a lever to change machine width up to 6' and to perform every travel and screed operation, including diagonal setting of rear screed, by smooth hydraulic power. No mechanical transmissions or clutches. Even tamper attachment and transportation mounting are hydraulically operated.

6' of infinite width adjustability—by hydraulic power: 12'-18' and 24'-30' are standard; special widths from 9' available.

Diagonal rear screed for pitched slab and curves: Adjustable as needed to work material up-hill and compact it against higher form. Saves carry-back. Quick crown change screeds adjust with single lever movement. (Conventional screeds and transverse rear screed, optional.)

Vibratory "bullnose" front screed or vibratory pan or tube attachments. Traction wheels for every condition.

You're years ahead in finishing capacity and precision with a Jaeger Type "J" or "JX" finisher. See your Jaeger distributor, or write for complete data, today.

THE JAEGER MACHINE COMPANY

701 Dublin Avenue, Columbus 16, Ohio

Distributors in More Than 150 Cities of U. S. and Canada

Low Cost Jaeger Aggregate Spreader Does Big Work

If you have a job of laying base or surface aggregate up to 13' widths and 12" thickness, or plant-mixed stabilized soil or any free-flowing bituminous material, you can save yourself money with a Jaeger self-propelled SPS-3 spreader. Costs only half the price of a bituminous paver; lays highway and airport base, and both base and top of secondary roads, parking areas and drives as fast as trucks can deliver material. Crawlers operate on subgrade—no traction on newly-laid material to cause high or low spots. Straightedge runners, supporting strike-off, average out subgrade irregularities. Blender gates and wings make perfect joints. Agitator bar attachment for handling stiff stabilized soil mixtures, if desired. Get new Catalog SPS3-7.



Laying 200 tons of base mix an hour, in four 3" courses.

ing transmission, change of travel direction without shifting gears, and double-disk brakes on a differential countershaft. A planetary underdrive doubles drive axle torque on-the-go without clutch, throttle, or shift. There is built-in power steering. The largest bucket used on a MM tractor is a 1 1/4 yard unit on the Util.

Ford

The Tractor and Implement Division of Ford Motor Co. is now merchandising one industrial loader for the 600 and 800 series gasoline tractors. It is available with either single or double-acting lift cylinders. Features are an independent hydraulic system, box-type frame and lifting structure, and step-in mounting. The last feature provides easy access to the tractor seat and makes dual equipment application efficient.

Case

The brand new Case 320 industrial wheel tractor has a 1/2 cubic-yard loader bucket. It features power leveling, 26-degree break-out angle, and 60-degree grading angle. Twin hydraulic cylinders control the bucket and an extra-large pump furnishes ample power for the loader and for a companion backhoe.

Sherman

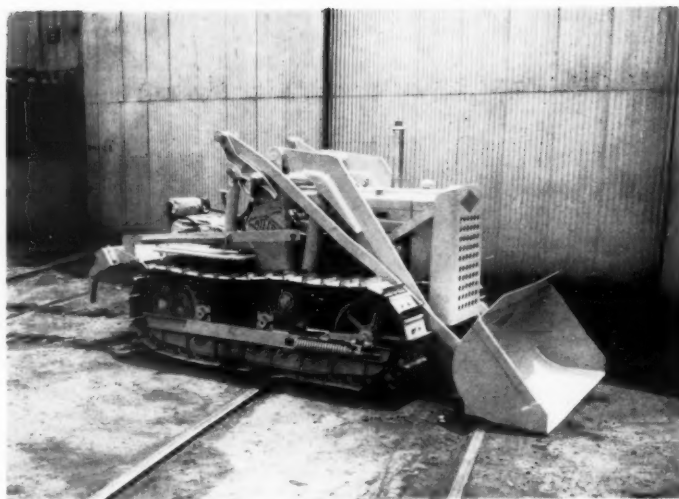
The Sherman is a tubular-frame loader for Fordson Major tractors. It is designed to transmit the bucket load to the rear wheels for greater traction. Mounted close to the front wheels, the Sherman bucket lifts 10 feet 10 inches high (ground to bucket) with minimum strain on the tractor and front wheels. Two models of 1/2 and 3/8-cubic-yard (struck) capacity are available through Ford tractor dealers.

Ottawa

Ottawa makes a line of front-end loaders that are used on Minneapolis-Moline and Case tractors, among others. Capacities are 1/2, 3/4 and 1 cubic yard. These loaders have an all-welded frame with lift arms cut from solid bar stock. They attach at or near the front axle pivot and to the rear axle housings to avoid strain on the tractor main frame. Recent improvements include welded rather than

For more facts, use Request Card at page 18 and circle No. 385

Biggest production models	Net engine hp	Rated capacity	Dumping height	Weight stripped
Wheel models				
Clark				
1952—none				
1957—375A	375	6 yards		56,000 pounds
Hough				
1952—HM	97	1½ yards	10 feet	17,130 pounds
1957—HO	125	2¼ yards	12 feet 8 inches	22,250 pounds
Pettibone				
1952—15	73	1½ yards	11 feet 3 inches	17,000 pounds
1957—250D	147	3¼ yards	12 feet	25,550 pounds
Tractomotive				
1952—TL10	40.5	¾ yard	9 feet 10 inches	10,650 pounds
1957—TL20	100	2 yards	11 feet 7 inches	22,100 pounds
Crawler models				
Caterpillar				
1952—6	80	2 yards	10 feet 9 inches	28,820 pounds
1957—977	100	2¼ yards	11 feet 9½ inches	31,105 pounds
Allis-Chalmers				
1952—HD-20GC	175	4 yards	13 feet 4 inches	61,000 pounds
1957—HD-21GC	204	4 yards	13 feet 4 inches	66,500 pounds



The Ateco loader on a John Deere crawler

riveted edges, oil and air filters standard on hydraulic systems, and a bucket level indicator as standard equipment.

Oliver

The Oliver OC-126 crawler unit is an integral tractor-loader of 1½-yard capacity. A new low-profile design has improved visibility and stability. Power-Turn steering gives the OC-126 two-track power at all times. The power unit is a 53-hp diesel or gasoline engine.

The line also includes a smaller 22-drawbar horsepower crawler unit with ¾-cubic-yard bucket, the OC-46.

Oliver's Super 99 wheel tractor is fitted with the 1½-cubic-yard Reese C-100 loader.

John Deere

This company entered the tractor-shovel market in 1956 with a ¾ yard (heaped) bucket for its two-cylinder, 30-hp. No. 420 crawler tractor. During the past year this tractor has been improved with a direction reverser which actually provides five reverse and five forward speeds. The loader comes with a 60-inch materials bucket, a 42-inch excavating bucket, a 72-inch bulldozer blade and a special fork.

Wagner Iron Works

Wagner makes a varied line of hydraulically operated loaders for Fordson Major, International, John Deere, and other light and medium tractors. Altogether, there are some 40 loader models and a wide variety of other attachments. Wagner loaders feature automatic self-leveling heavy-duty buckets with controlled break-away. These are unit-welded loaders of rigid tubular truss designs.

Teale & Co.

Teale makes a line of loaders in ¾ to 1-cubic-yard capacities. They will fit various models of Caterpillar, International, Oliver Cletrac and other tractors. Features include a special bucket-shake-out device, unobstructed visibility, and the close-mounted bucket.

The bucket lifts to 8½ feet measured to the hinge point. Forty degrees of tip-back at ground level, 8,500 pounds of break-out force, and the

KANSAS TURNPIKE Self widener purchased for use on Kansas City, Missouri, Freeway interchanges—built in flexibility made use on Kansas Turnpike equally profitable.



Again Flex-Plane has the nation's number one finisher

For the past three years, contractors have bought more Flex-Planes than all other makes — They will again in 1957...here's why

From the moment the FLEX-PLANE finisher was introduced it has been the favorite of the nation's highway builders. For the past three years it has been in a class by itself—the most versatile, most flexible, most portable and least expensive to operate of any machine on forms.

Now, for 1957, the FLEX-PLANE finisher is even

INDIANA TURNPIKE More miles of Indiana Turnpike were finished with Flex-Plane machines than any other.



NEW JERSEY TURNPIKE Holland Tunnel cutoff had many ramps and sections. Self-widening feature paid dividends.



ability to dig 9 inches below ground level are other features of this bucket.

Ateco

The Greenville Steel Car Co. makes a standard bucket of $\frac{3}{4}$ cubic yards and a 1-cubic-yard light material-handling bucket for the John Deere tractor. The Ateco has replaceable lubricated pins and bushings at all hinge points and double-acting cylinders, and it is designed to give an unrestricted view. The bucket automatically tilts back for level lift and then returns to digging position after dumping.

Shawnee

The Loadmaster loader made for John Deere and Fordson Major tractors is available in $\frac{3}{4}$ and 1 cubic-

yard capacities. These are all-welded units mounted on the back axle and balanced for easy steering.

Shawnee also makes the Special, an 11 cubic-foot loader for Ford, Ferguson, and other tractors of this particular size.

Ulrich

The Ulrich loader line consists of the $\frac{7}{8}$ -cubic-yard No. 2 and the $1\frac{1}{4}$ -cubic-yard Model D4-H, both for Caterpillar tractors. The No. 2 has been designed for long-track, D2 tractors. The D4-H has been built specially to replace the old cable-operated Traxcavators on Cat D4-H tractors. The manufacturer supplies the D4-H either with a new bucket or with brackets to be welded on the old Traxcavator.

Garrett

This 1-cubic yard (struck) bucket is designed for the Model 60 Garrett All-Drive tractor. The Garrett is a four-wheel drive machine, about 80 per cent of which is constructed of standard International Harvester components. A structural feature of the bucket is the "parallelogram" design of the bucket arms that permits the tilting and pushing arms to be mounted on the same shaft.

Thew Moto-Loader

Before the end of this month, Thew Shovel Co. starts production of $1\frac{3}{4}$ -yard Moto-Loaders on a limited basis. The company, with a $\frac{1}{2}$ -yard model now available, is developing a complete line of rubber-tire front-end loaders for the construction industry.

The tractor-shovel of the future

Though they are understandably silent about details of models now in the development stage, manufacturers have indicated, generally, where improvements are likely to be made.

The trend to the torque converter and automatic transmission will probably continue and will also spread to some light and medium modified agricultural-type units. Push-button shifting and bucket control were suggested as further improvements.

Buckets are likely to have more specialized functions and a greater number of powered articulated parts.

Specialized front and rear-end attachments will continue to increase operating flexibility and may become instantaneously interchangeable.

Manufacturers plan to beat the fatigue problem by turning more attention to the comfort of the operator. Better visibility, enclosed cabs, and pneumatic vibration absorbers are possible answers to some problems.

Maintenance problems may be cut by automatic, centralized lubrication. Also, dangerous wear or breakdowns of vital parts may be detected by built-in automatic devices.

The transformation of the little up-and-down loader into a speedy, flexible, yet powerful excavator continues. It will be interesting to see what the demand of contractors and ingenuity of manufacturers produces in the tractor shovel of the future.

For information on tractor shovels circle these numbers on card at page 18:

Allis-Chalmers Manufacturing Co., Milwaukee, Wis.	236
American Road Equipment Co., Omaha, Neb.	237
Case Co., J. I., Racine, Wis.	238
Caterpillar Tractor Co., Peoria, Ill.	239
Clark Equipment Co., Jackson, Mich.	240
Deere & Company, Moline, Ill.	241
Dempster Brothers Inc., Knoxville, Tenn.	242
Eimco Corp., Salt Lake City, Utah	243
Ford Motor Co., Tractor & Implement Div., Birmingham, Mich.	244
Garrett Corp., Los Angeles, Calif.	245
Greenville Steel Car Co., Greenville, Pa.	246
Hough, Frank G. Co., Libertyville, Ill.	247
Drott Manufacturing Co., Chicago, Ill.	248
M-H-F Work Bulls Div. of Massey-Harris-Ferguson, Inc., Racine, Wis.	249
Mid-Western Industries, Inc., Wichita, Kans.	250
Minneapolis-Moline Co., Hopkins, Minn.	251
Mixermobile Manufacturers, Portland, Oreg.	252
Nelson Iron Works, Inc., Clifton, N. J.	253
Oliver Corp., Chicago, Ill.	254
Ottawa Steel Div., Bowling Green, Ohio	255
Pettibone Mulliken Corp., Chicago, Ill.	256
Shawnee Manufacturing Co., Inc., Topeka, Kans.	257
Sherman Products, Inc., Royal Oaks, Mich.	258
Teale & Co., Omaha, Neb.	259
Tractomotive Corp., Deerfield, Ill.	260
Ulrich Manufacturing Co., Roanoke, Ill.	261
Wagner Iron Works, Milwaukee, Wis.	262
Yale & Towne Mfg. Co. Contractors Machinery Div., Philadelphia, Pa.	263
Thew Shovel Co., Lorain, Ohio	268

THE END



TEXAS CITY STREETS Contractor reported highest pouring ever. Credits Flex-Plane. Note amount of concrete in front of screed here.

better! It is more flexible, stronger and faster than ever! Inherent frame design features allow the greatest amount of flexibility—even as much as 12 to 25 feet in one machine! And, there is a complete line of FLEX-PLANES to cover any width range desired. Only FLEX-PLANE self-widening offers independent control of extension frames, which means both sides of the machine can be extended or retracted to-

gether—or individually, for the negotiation of complicated interchange patterns involving variable width and short radius super elevated curves. But, more important, it is the only really proved self-widening machine available today. More than 60 units operating throughout the nation attest to this.

The FLEX-PLANE carries the largest screeds in the industry—delivering the most satisfactory finish possible. Exclusive butt joint screed design enables screed lengths to be changed faster, easier than ever before. It is completely portable—a flick of the finger and it, instantaneously, becomes its own trailer.

Why not let FLEX-PLANE put you in contact with a FLEX-PLANE user? Talk to him and we are sure you, too, will GO FLEX-PLANE IN 1957!



THE FLEXIBLE ROAD JOINT MACHINE COMPANY
512 THOMAS ROAD WARREN, OHIO

261

For more facts, use Request Card at page 18 and circle No. 386



RODEN STATE PARKWAY Contractor watched machine operate on nearby Route 1 project. Bought immediately.

manufacturer memos

A-C appoints Hebeler export sales director

Walter A. Hebeler has been appointed director of export sales for the Tractor Group, Allis-Chalmers Mfg. Co., Milwaukee, Wis. He was formerly export sales manager for the company.

Hebeler joined A-C at its Kansas City branch in 1933, and was later transferred to the Des Moines, Iowa, office. Three years later he was moved to Buenos Aires, Argentina, as a sales manager. In 1940 he became the gen-



Walter A. Hebeler,
director of export
sales for the Tractor
Group, Allis-
Chalmers Mfg. Co.

eral sales manager there, and eventually branch manager. In 1950 he was made special export representative for the Tractor Group in Milwaukee.

The firm has appointed Henry Larsen assistant general works manager, succeeding Owen J. Higgins, who was named general manager of the Harvey, Ill., plant. Larsen will work with the Tractor Group plants.

Wallace Collett has been named product sales manager of the firm's

Material Handling Department, Tractor Group. Until now he has been associated with the Tractor Group's sales training section.

Koehring names research vice president, others

E. O. Martinson has been appointed to the newly created post of vice president in charge of research and development for the eight divisions and subsidiaries of the Koehring Co., Milwaukee, Wis. Martinson was formerly president and general manager of Koehring-Waterous Ltd., Brantford, Canada, a post that D. W. Marchant now holds.

Marchant is succeeded in his former position as vice president and general manager of Koehring South-

E. O. Martinson,
vice president in
charge of research
and development
for the Koehring
Co. and its eight
divisions and sub-
sidiaries.



D. W. Marchant,
president and gen-
eral manager of
Koehring - Water-
ous Ltd.

ern, Chattanooga, Tenn., by Harry S. Jeske. Jeske was general superintendent at Koehring Southern. Loring Click, previously assistant to the works manager at the firm's home plant, has taken over Jeske's former job.

Cummins Engine elects vice president, directors

N. M. Reiners has been elected vice president of research for the Cummins Engine Co., Inc., Columbus, Ind. Reiners, a member for the firm for 20 years, has served as manager of the research laboratory, manager of research and refinement, and director of research.

Re-elected to the board of directors were J. I. Miller, chairman; C. L. Cummins, honorary chairman of the board; R. E. Huthstener, president; E. D. Tull, executive vice president; C. R. Boll, H. E. Bollwinkel, D. J. Cummins, C. R. Fox, W. M. Harrison, V. E. McMullen, and R. B. Stoner, vice presidents. W. J. Manning is assistant secretary and treasurer.

Lycoming appoints Kerr president

James R. Kerr has been appointed president of the Lycoming Division, Avco Mfg. Corp., Stratford, Conn., succeeding S. B. Withington, who retired. Kerr joined Avco in 1954 and has held such posts as director of the



James R. Kerr,
newly appointed
president of the
Lycoming Division
of Avco Mfg. Corp.

West Coast Division of Avco, and assistant general manager of its Research and Advanced Development Division.

Kerr was also head of Avco's office of defense planning, and a vice president. Lycoming produces industrial engines for construction and industrial fields.

Flintkote elects Pecaro executive vice president

George J. Pecaro has been elected executive vice president of the Flintkote Co., New York, N. Y. He succeeds Perce C. Rowe, who was named pres-

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ident of the company.

Pecaro, who joined the firm in 1939, has held many executive posts in Flintkote—general manufacturing manager, general manager of the



George J. Pecaro, executive vice president of Flintkote Co.

Pioneer Division, vice president, director, and most recently, general vice president.

At the same time the firm also elected Wilson Harvey, John Legh-Jones, and Richard G. Wace vice presidents. Harvey, whose longest

Wilson Harvey, newly elected vice president of the Flintkote Co.



service has been with the firm's Pioneer Division on the West Coast, will continue as that division's general manager.

Legh-Jones, who continues as managing director of Industrial Asphalts Co., Ltd., London, England, Flintkote's subsidiary, has been directly associated with the expansion of the firm's overseas operations for the past 10 years. Wace, presently general manager of the Flintkote Co. of Canada, Ltd., Toronto, has also served as a vice president and director of that affiliate. He is also a director and vice president of Flintkote Mines, Ltd., the firm's asbestos producing affiliate.

Feldmann elected president of the Worthington Corp.

The Worthington Corp., Harrison, N. J., elected Walther H. Feldmann president, succeeding Edwin J. Schwanhauser, who became vice chairman. Feldmann joined Worthington in 1944 as president and general manager of Electric Machinery Mfg. Co., which became part of Worthington that year. He has been vice president in charge of sales, executive vice president, and a member



Walter H. Feldmann, newly elected president of Worthington Corp.

of the board of directors.

Schwanhauser, a 42-year veteran with the firm, has held such posts as assistant works manager, works manager, vice president, executive vice president and president.

B-E sales representative

Dean Calland has been made a sales representative of the Western Sales District of Bucyrus-Erie Co., South Milwaukee, Wis.

Thor power elects Lind, Corkery vice presidents



James A. Lind (left) and John F. Corkery (right), vice presidents of finance and public relations, respectively, of Thor Power Tool Co.



James A. Lind and John F. Corkery have been elected vice presidents of finance and public relations, respectively, for the Thor Power Tool Co., Aurora, Ill. Lind, a 20-year veteran of the firm, has held such posts as audi-

tor, comptroller, and treasurer.

Corkery, who joined Thor as assistant editor of the house organ, has served as sales promotion manager and electric tool division manager. He is active in many national construction organizations.

Willys Motors promotes

James J. Beattie, Jr., has been appointed manager of the Western division (with headquarters in San Francisco) of Willys Motors, Inc., Toledo, Ohio. Beattie, who formerly managed the firm's Eastern division, succeeds Howard P. Grove, who is taking a leave of absence.

C. M. Ritchey takes over Beattie's former position and will make his headquarters in New York City.

H. K. Porter division names sales manager

Gordon N. Dow has been appointed general sales manager of the Leschen Wire Rope Division, H. K. Porter Co., Inc., New York, N. Y. Dow will make



Gordon N. Dow, general sales manager for the Leschen Wire Rope Division, H. K. Porter Co., Inc.

his headquarters in Leschen's main office in St. Louis, Mo.

He has been a salesman for the firm in the Detroit area, and sales manager of the Chicago district.

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Left: The Utility Tractor and Power Hole Digger—today's easy method for digging holes for posts, guard rails, tree settings, and construction work. Digs as deep as 40 inches; several auger sizes.



Left—John Deere "420" Utility Tractor and rear-mounted scarifier-scraper. This is one of many "pick up and go" tools that mount on the tractor's standard 3-point hitch.



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labor review

Record activity in public works during April pushed **total spending on all types of construction** to a new peak for the first four months of 1957, according to data compiled by the Departments of Commerce and Labor.

Spending for private projects lagged a bit behind the January-April period of 1956, but a sparkling 11 per cent rise in public expenditures raised the total for the first four months of this year to a new record—2 per cent above the previous high set one year ago.

Total outlays for the first four months of 1957 amounted to \$12,536 million, as compared with \$12,260 million for the comparable 1956 period. Private spending came to a four-month total of \$8,871 million, down 1 per cent from last year.

A nation-wide survey shows salary ranges in eight distinct grades, fringe benefits, and hours of work and overtime in 311 **engineering consulting firms** employing 6,407 engineers.

The survey is the work of a subcommittee of the Employment Practices Committee of the National Society of Professional Engineers. Publication of the report is described as the first step in a long-range program of obtaining basic facts about the composition and status of engineers employed by consulting firms. The next step is to be an analysis of the findings and the development of programs to meet the needs of engineering employees "in their professional and economic development."

The firms surveyed ranged in size from 40 employing only one engineer to one employing more than 300 engineers. Of the total surveyed, 37 per cent employed two to five engineers; almost 17 per cent employed six to ten engineers; 12.5 per cent employed 11 to 20; 11 per cent employed between 20 and 50; and 10 per cent employed more than 50.

Engineers are defined to include "all engaged in engineering work at the level which requires knowledge of engineering, physical, natural, or mathematical sciences equivalent to at least that acquired through completion of a four-year professional college course." Of the eight engineering grades, the first three are labeled "pre-professional," with the scope of Grade One being to "perform routine tasks requiring knowledge of engineering fundamentals related to a particular field of work . . . under close and immediate supervision." Grade Eight requires the engineer to "supervise and direct with final administrative authority a large engineering or research organization comprising major division."

Salaries—The median monthly salaries for the eight labor grades, with the percentage of total surveyed employees falling within each range indicated in parentheses, are as follows: Grade One (8.1 per cent), \$358; Grade Two (13.5 per cent) \$433.55; Grade Three (20.2 per cent), \$504.40;

Grade Four (23.8 per cent), \$582.12; Grade Five (16.7 per cent), \$657.70; Grade Six (8.4 per cent), \$768.89; Grade Seven (3.6 per cent), \$947.02; and Grade Eight (1.4 per cent), \$987.54.

Fringe benefits—As might be expected, the report observes, firms employing larger numbers of engineers tend to give their employees more fringe benefits than smaller ones. Paid vacations (granted in 95.8 per cent of the firms surveyed) and bonuses (in 63.7 per cent) are the most prevalent fringes.

Life insurance and hospitalization

benefits, while established in the majority of firms employing more than 50 engineers, are granted in only 35.7 per cent and 40.2 per cent, respectively, of all those surveyed. Pensions are granted in only 8.7 per cent of all firms and in 32.3 per cent of those employing more than 50.

Hours of work and overtime: The standard workweek is 40 hours in 56.9 per cent of all the firms; only 5.8 per cent work less than 40 hours, while 28 per cent operate on a 41 to 44 hour work week and 6.4 per cent have a standard work week of more than 44 hours.

Some 213 firms (68.5 per cent of the total) reported that they operate on uniform overtime-pay systems. Of this number, 60 provide time and one-half, 78 straight time, 23 compensatory time off, and 52 no payment.

Copies of the 40-page survey report may be obtained for \$1 each from the National Society of Professional Engineers, 2029 K Street, N. W., Washington 6, D. C.

The Bureau of Labor Statistics' quarterly survey of seven major building trades in 100 large cities finds that the **average union scale of**



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CONTRACTORS AND ENGINEERS

construction workers reached \$3.09 an hour on April 1. This represents an increase of 0.4 per cent since the first of the year—about half as much as the increase in rates during the first quarter of 1956.

During the January-March period of 1957, the Bureau says, about one-tenth of the construction workers received pay hikes. The wage adjustments covered 15 per cent of the building laborers, 13 per cent of the electricians, and 11 per cent of the carpenters. In the other trades surveyed, the proportion of workers getting raises was between 4 and 8 per

cent.

BLS finds that about one-third of the pay raises put into effect during the first quarter amounted to 10 cents an hour. The next most common adjustments were 5 cents, 12½ cents, and 15 cents, each figuring in one out of eight revisions.

Compared with a year ago, union building trades scales on April 1 were up 4.3 per cent, or 12.7 cents an hour. Among the seven trades surveyed, the over-the-year advances ranged from 10.3 cents an hour for building laborers to 17.3 cents for bricklayers. On April 1, BLS says, average union scales in the industry were 50 per cent above the 1947-49 average.

At the end of the first quarter, the Bureau finds, union scales averaged more than \$3 an hour for all of the building trades except laborers. Highest rates were \$3.69 for bricklayers and \$3.54 for plasterers.

The contractor and a machinists local are both found in violation of the Taft Act in the discharge of a crane operator and a crane oiler employed in the construction of the Walt Whitman Bridge between Philadelphia and Gloucester City, N. J., according to an NLRB trial examiner's intermediate report.

The case was brought by John J. Testa, the operator, and Joseph F. Scarpello, the oiler, against Booth & Flinn Co. and Machinists Local 825. The workmen, members of Machinists Local 542 and 542A, were hired for work at the Philadelphia end of the bridge and were given indications they would accompany the 20-ton crane they were operating and servicing to the New Jersey side to continue their work.

The job superintendent told Testa and Scarpello he would "fix it up" with Local 825 so that the two Philadelphians could work in the area over which the Local had jurisdiction. The master mechanic on the New Jersey side, a Local 825 member, reported back, however, that "they had a lot of men out of work and he would rather" the two men were not employed in New Jersey.

Testa and Scarpello were subsequently discharged.

Trial examiner finds that the company did not have a union shop agreement with Local 825 even though it chose to hire most of the labor for the New Jersey construction through the union. He says further that although the job superintendent did not specifically tell Testa and Scarpello they would be employed on the New Jersey side, he "led them to believe that they would work there . . . and never told them otherwise."

In addition, he observes that jobs which the two men could have filled were available on the New Jersey side.

Examiner recommends that the company and the union jointly compensate the two men for any loss of pay they may have suffered between

the date of their discharge and completion of work on the bridge.

The National Labor Relations Board takes a backward look over its work during fiscal 1956 and finds that 934 construction cases were included among the total cases it handled during the 12 months (July 1, 1955, to June 30, 1956). However, an NLRB official notes, many cases drop out in the preliminary stages, before any action is taken by the Board.

Looking at the 934 construction cases received during fiscal 1956, the Board found they broke down in the

following manner:

232 cases involved charges of unfair practices against an employer.

565 were charges of unfair labor practices against a union under various sections.

119 were petitions by unions or employers for certifications of representatives for collective bargaining.

18 were petitions by employers to certify representatives.

A review of the elections actually conducted by NLRB finds 46 elections involving 6,716 eligible voters held in the construction industry.

THE END

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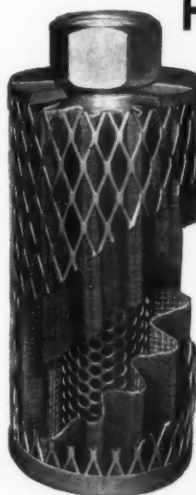
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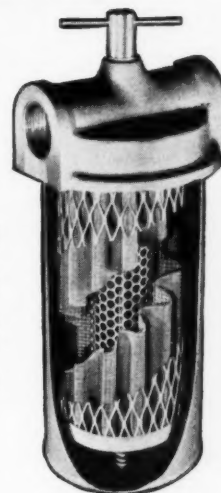
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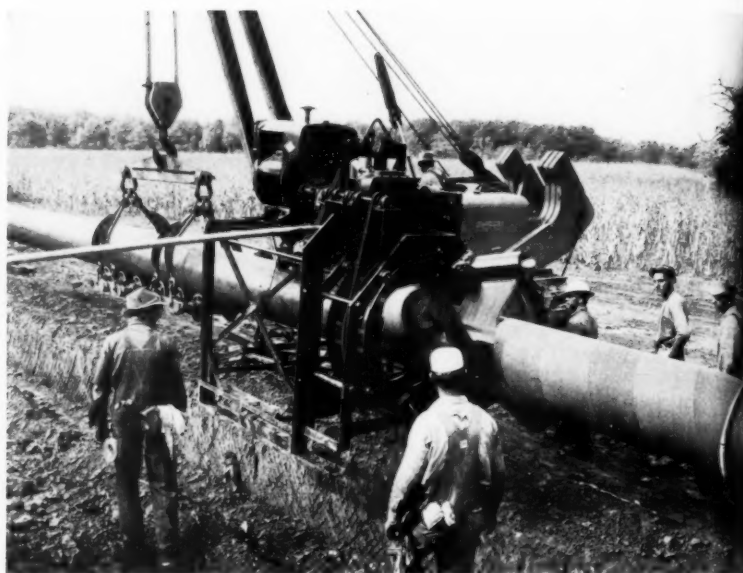
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by RALPH MONSON,
field editor

Tape wrapping cuts down on equipment and men needed for pipeline job

**Plastic tape substitutes for conventional dope
and wrapping on 122 miles of 22-inch line**



A new material used at the coating and wrapping stage of the pipe-laying job cut down on the number of men needed and, since no dope was required, eliminated the need for dope pots and extra handling equipment.



Buckeye Model 48 trenchers dig for the 122-mile gas line. The first digs 30 or 40 inches deep. The second, cuts the 46 to 48-inch-wide trench to its 68-inch finished depth.



A Cinch pipe-bending machine bends pipe joints. The Cat MD7 pipelayer, using Cardwell automatic calipers to handle the pipe, also moves the bender from place to place.



The Cat D7 with side boom uses the Cardwell automatic caliper to set pipe in place on an M. J. Crose pipe clamp that is in contact with the last pipe placed. Three Lincoln welding generators will weld the pipe sections together.



This mobile X-ray unit, belonging to Industrial X-Ray Engineers, Houston, is carried by a Dodge Power Wagon truck as joint inspection is done by Ford, Bacon & Davis, New York City.

Before the coating operation starts, the exterior of the pipe gets a cleaning from a C-R-C cleaning machine. An Allis-Chalmers HD-20 tractor with Tractomotive side boom uses an M. J. Crose cradle to hold the pipe as this work is done.

* Expensive, but compensated for by saving in manpower and equipment, is the wrapping with Polyken No. 900 tape, supplied in 800-foot rolls 15 inches wide, which is applied in a single thickness with a 10-inch overlap. The Remco tape wrapping machine also applies a wrapping of 8-pound Johns-Manville pipeline felt over the tape. The ring at right is a Tinker & Rasor holiday detector operating on 7,500 volts to search for imperfections in the coating.

Since they do not have to wait for dope to harden, crews place the pipe directly into the trench behind the wrapping machine. The Cat D7 tractor with the backfiller works behind the extra tractor used to handle pipe at the start and end of each run.





As the 40-foot random joints of 22-inch pipe arrive at one of the eight unloading points, they are picked off the gondola cars by a P&H truck-crane on an International carrier and loaded, seven at a time, to pipe trailers pulled by International 195 trucks.



A Cat D7 with dozer and D8 with angled dozer cut a path up a steep hill to make a road for the pipeline equipment along the 122-mile route of the line.

cleaning machine. With an Allis-Chalmers HD-20 tractor cradling, the Remco tape-wrapping machine followed the cleaning machine, applying the tape and felt in a single operation.

Since there was no need for the crew to wait for dope to harden and no need for the touching up of bad spots by hand, crews were able to lay the pipe directly in the trench behind the wrapping machine. The backfiller stayed so close to this operation that it looked as if it belonged to the wrapping gang. There was rarely more than 400 or 500 feet between the cleaning machine and the backfiller.

The project on which this trial run was made was a 122-mile section of 22-inch natural gas pipeline built for the American Louisiana Pipe Line Co., Detroit, Mich., by Houston Contracting Co., Houston, Tex. The line cuts across the southwestern corner of Michigan and the northeastern corner of Indiana into Ohio, joining American Louisiana's 30-inch line at Defiance, Ohio, with the Michigan-Wisconsin Pipeline at Bridgman near Benton Harbor, Mich.

Sets fast pace

The coating and wrapping operation on this well planned and smooth functioning pipeline project had its effect on other operations. Since the tape-wrapping gang was seldom delayed, the rest of the crews had to stay on their toes to keep ahead.

The 22-inch steel pipe, with a wall thickness of 0.281 inch, was furnished in 40-foot random joints by Youngstown Sheet & Tube Co. and shipped by rail to eight unloading points along the route. At these points, the stringing subcontractor, J. O. Willett, Monroe, La., transferred the pipe to truck-trailers and strung them out along the right-of-way.

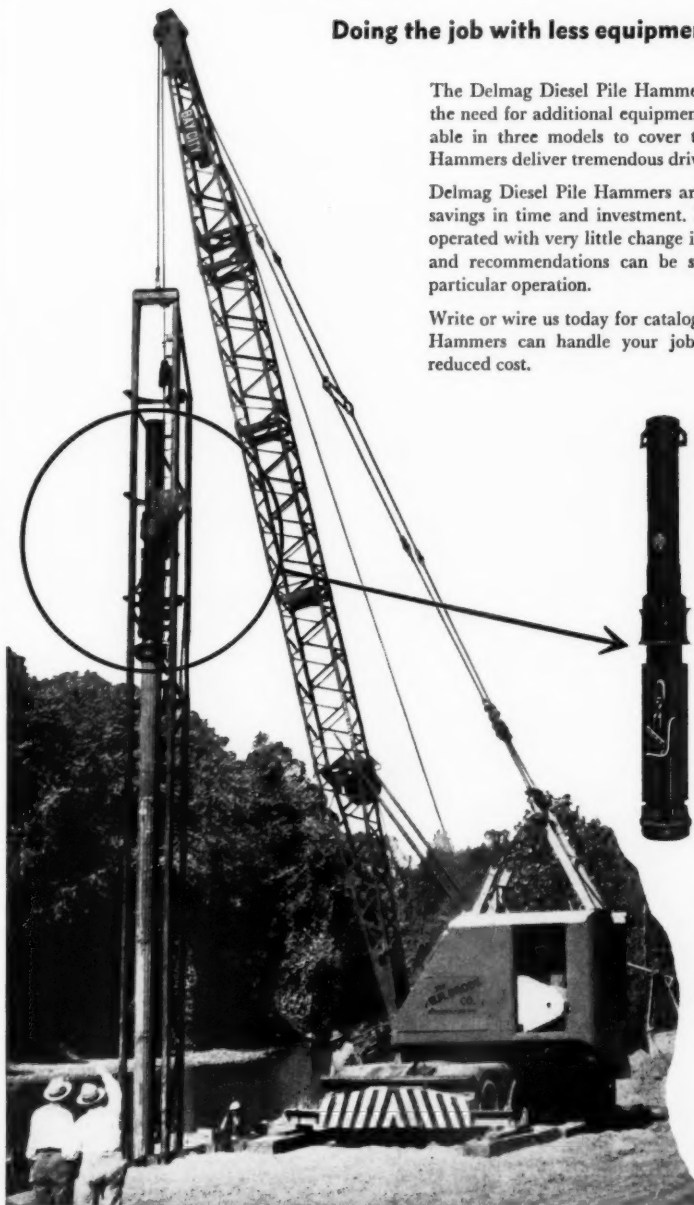
Using a P&H truck-crane on an International carrier, Willett got seven joints per load on Neway pipe trailers pulled by International 195 trucks. When the trucks pulled off the roads onto the right-of-way, a Caterpillar D7 tractor with Hyster winch hooked on and helped the truck through the bad spots. The stringing crew, which handled as much as 25 miles of pipe in eight days, had another D7 with Trackson side-boom to pick the pipe sections

(Continued on next page)

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Welders make the "hot pass" weld before the first weld has cooled. Current for the welding machines is supplied by four Lincoln 250-amp generators carried on the GMC 6x6 army surplus truck. The covers carried by the trucks shield workers from the rain.



9:01 A.M. WELLPOINT GENERATOR AT WOODMERE IS REPORTED BURNED.



9:02 A.M. FIELD REPAIRMAN IS ALERTED.

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(Continued from preceding page)

off the trailer and set them along the right-of-way.

Clearing and right-of-way gangs worked far ahead, getting the route ready for the train of equipment that followed. Trees and brush were cut with Homelite power saws and Little Giant circle saws. A Caterpillar D6 tractor-dozzer and a D7 with Trackson side boom separated the logs and poles from the brush and stacked the brush for burning. Logs and poles were used for riprap and fencing or were salvaged for the landowner.

Three Caterpillar D8's with angle-dozers and a D7 tractor-dozzer graded the rough spots of the right-of-way to make a road for the other machines. Since they were sometimes

working in areas not accessible to the fuel tanker, the grading crew carried an Athey track-trailer equipped with a 500-gallon fuel tank and carrying lubricating supplies and equipment as well as spare cable.

Ditching

Most of the pipe trench was dug by two Buckeye Model 48 trenching machines powered by Caterpillar D13000 engines. The two machines worked in tandem, the first making a cut 30 to 40 inches deep and the second going down to the finished grade—about 68 inches deep. A job-built drag, pulled behind the second trencher, pushed the loose dirt back from the edges of the 46 to 48-inch wide trench.

Wherever it was uneconomical for the trenchers to dig, three Bucyrus-Erie 22-B backhoes excavated the trench. These rigs dug out the larger holes at road crossings for the boring machine and cut the trench in rough areas where the Buckeye machines could not operate or where, if they were used, the pipe would be bent excessively.

As the trench was dug, casings were installed under all roads and railroads by an M. J. Crose boring machine. Cradled by a Cat D8 and anchored to a D7, it bored under the roadways, pushing the 26-inch pipe sleeves through the hole as it was bored. These casings went into place rapidly, and they prevented any disturbance of the roadways. This not only reduced the work of the cleanup crew, but also helped maintain good public relations.

The job of bending the big pipe to fit the grade and alignment of the trench was handled by a Cinch bending machine and a Caterpillar MD7 pipelayer. The MD7 fed the pipe to the bender with a Cardwell automatic caliper that enabled the tractor operator and one assistant to handle the pipe joints quickly and easily.

Another D7 side boom tractor with a Cardwell caliper set up the joints for the pipe crew, placing each joint, seam up, on a timber crib. The beveled ends of each joint were wire-brushed by a workman with a Sioux wire brushing machine. This was powered by a Homelite generator carried in a Dodge Power Wagon truck.

Welding pipe

The pipe gang used a Caterpillar D7 side boom tractor with a Cardwell caliper to place the joints over an M. J. Crose internal pipe clamp while two welders made the initial weld. Three Lincoln 300-amp welding generators, carried on a Diamond T army surplus 6x6 truck, supplied the current.

A GMC 6x6 army surplus truck carrying four Lincoln 250-amp generators was right behind to provide current for the welders making the "hot pass" weld. Twelve Lincoln 200-amp generators mounted on individual John Deere rubber-tire wagons supplied the current for the remainder of the welding job. An Interna-

CONTRACTORS AND ENGINEERS



Cradled from the side boom of a D8, an M. J. Crose boring machine cores a hole under a roadway and pushes the pipe casing through so the roadway is not disturbed. The 22-inch pipe will be laid in the 26-inch casing later.



The men that make the job check up on the wrapping operation at the site. In the usual order are Sherman Selvidge, coating inspector; R. D. McClintock, vice president of American-Louisiana Pipeline Co.; A. J. Evans, chief inspector for Ford, Bacon & Davis; and Earl Norris, superintendent of the project for Houston Contracting Co.

tional Model 50 wheel tractor leap-frogged these rigs as the welding was being completed.

The welded connections were checked by an X-ray machine carried on a Dodge Power Wagon truck. The over-all inspection of the job was handled by Ford, Bacon & Davis of New York City; the X-ray work was done by Industrial X-Ray Engineers of Houston, Texas.

Tape protects pipe

The small coating and wrapping crew of 20 men or less really set the pace for the job. With just three cradling tractors, a cleaning machine, and the tape wrapping machine, this crew wrapped and laid an average of 11,000 feet of pipe in the ditch per day. The actual wrapping time—averaging 7 hours a day—became the really outstanding feature of the job.

Leading the gang was an Allis-Chalmers HD-20 tractor with a Tractomotive side boom and an M. J. Crose rolling cradle. This rig cradled the pipe immediately ahead of the C-R-C cleaning machine that removed the scale, rust, and dirt from the outside of the pipe.

A few feet behind these rigs was a second HD-20 tractor, similarly equipped, which cradled for the Remco tape-wrapping machine. This four-spindle machine carried two of the 800-foot rolls of Polyken No. 900 tape and two rolls of 8-pound Johns-Manville pipeline felt. The 15-inch-wide tape, applied in a single thickness with a 1-inch overlap, was immediately covered by the felt as the machine moved ahead on the pipe.

As the wrapping progressed, the tape, with the contracting pressure of the elastic film on its underside making it act like a gasket seal, filled surface imperfections along the pipe and the annual space at the top. On the completed pipeline, it will serve to interrupt the corrosion process and protect the line.

Just behind the wrapping machine, an inspector worked with a Tinker & Rasor holiday detector that checked every square inch of the coating for possible defects. Imperfections rarely showed up in the coating under the 7,500 volts of the holiday detector. It was not unusual to check several days' wrapping without finding a single "jeep".

At the start of a run, a third side boom tractor was required to set the pipe into the trench after the wrapping machine had advanced far enough. Once the end of the pipe had been set into the trench the rest of

(Continued on next page)



POWERED BY A JAEGER "600" ROTARY, a Ka-Mo auger rig drilled holes for 700 twenty-inch square pre-cast concrete piles supporting

the new causeway bridge across Biscayne Bay between Miami and Miami Beach. Powell Brothers, Ft. Lauderdale, contractor.



DOUBLE TEAMED TO SPEED JOB PROGRESS: Jaeger "600" Rotary powers 18 h.p. Ka-Mo auger drilling 24" holes for 50' to 60' utility poles of the Florida Keys Electric Cooperative. Equipment was trailer mounted to move quickly from pole structure to structure.

(More than 700 were installed). All types of strata were encountered in 33 miles between Homestead and Tavernier, Fla., ranging from submerged coral rock to muck. J. K. Sims, sub-contractor, under Leo T. Barber, contractor, both of Moultrie, Ga.

Jaeger-powered drill beats pile driving 8 to 1

On two projects along Florida's Gold Coast, the combination of a Jaeger "600" rotary air compressor and Ka-Mo drill cut difficult pile and pole setting jobs down to size. On both the Florida Keys job shown above and the McArthur Causeway bridge project between Miami and Miami Beach, much of the drilling was in "iron-hard" coral rock, 8' to 10' under water. In a test run for the contractor,

Jaeger air easily powered the 24" drill 16' into dry limerock in one hour, saving 7 of the 8 hours previously found necessary to drive a pile into this formation.

The higher efficiency of Jaeger Roto Air Plus® units really cuts your operating and maintenance costs. For example, at full load speed, the Model 6-71 GM diesel engine of a Jaeger "600" runs at only 1650 rpm (100 to

150 rpm slower than other "600" rotaries). This slower, more efficient operation saves fuel, reduces engine piston travel and cuts compressor work as much as 9000 revolutions per hour.

Other Jaeger rotaries (125, 250 and 365 cfm) have this same fuel-saving, wear-saving, high-efficiency performance. See your Jaeger distributor for full details or demonstration — or let us send you Catalog JCR-5.

THE JAEGER MACHINE COMPANY

701 Dublin Avenue, Columbus 16, Ohio

PUMPS • CONCRETE MIXERS • SPREADERS • FINISHERS • TRUCK MIXERS

For more facts, use Request Card at page 18 and circle No. 392

(Continued from preceding page)

the pipe followed naturally; the third tractor then simply followed along until it was needed again at the other end of the run.

The Caterpillar D6 backfiller worked right behind the wrapping crew, putting enough dirt in the trench to anchor the pipe. There was rarely more than 400 to 500 feet between the cleaning machine at the head of the operation and the backfiller at the rear and, in this short space, the cleaning, wrapping, and lowering-in jobs were completed.

The tie-in crew, making the final connections between sections of pipe, used four Caterpillar D8 side boom tractors and four 200-amp Lincoln welders to clean the final joints and

wrap them by hand.

When all the pipe sections had been tied in and the trench backfilled, the cleanup crew straightened up the right-of-way, repaired fences, placed markers, and did the multitude of other chores necessary to return the land to its initial status. The chief rigs used by this crew were three Caterpillar D7 tractor-dozers and an International TD-18 tractor with a Rome disk.

Personnel

Supervising the entire project for Houston Contracting Co. were superintendent Earl Norris and assistant superintendent Gene Thornton. The superintendent for Willett on the stringing was W. B. "Bill" Matthews. The foremen of the several crews

were: right-of-way, George Brown; clearing, J. E. Clifton; road crossings, A. B. Cate; ditch, Charles E. Vermillion; bending, L. A. Tull; pipe, J. W. Hartwick; welding, Jack Slovack; coating and wrapping, Carl Parker; tie-in, Pat Patterson; and cleanup, H. J. "Frenchie" Guidrouz.

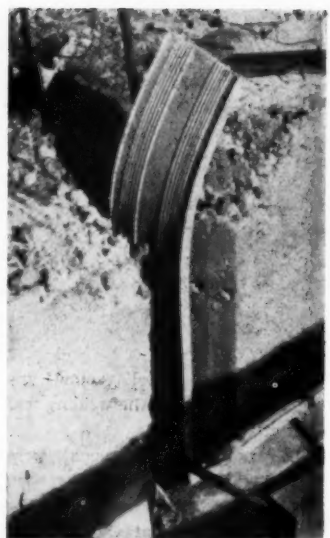
The chief inspector for Ford, Bacon & Davis was A. J. Evans. Inspecting the coating operation was Sherman Selvidge.

THE END

Case history

Durable waterstops seal concrete joints on Seaway

On St. Lawrence Seaway projects, long ridged ribbons made of Bakelite vinyl resins are being sealed into joints between concrete structures to



Durajoint and Duraseal waterstops are being sealed in concrete joints on several St. Lawrence Seaway projects.

prevent water leakage. Installed when the concrete is poured, these diaphragm-type waterstops for expansion and construction joints are expected to outlast the structures in which they are used, according to the manufacturer.

Sections of a concrete sewer tunnel for the seaway project at St. Lambert, Quebec, have these flexible Durajoint and Duraseal waterstops embedded at the joints between sections. Because the waterstops have excellent elongation, they can stretch or contract to keep the tunnel watertight as the joints open and close in winter and summer. According to the contractor, these waterstops were chosen not only for their elasticity and strength, but for their resistance to water and the acids and alkalis in concrete as well.

A tensile strength of not less than 1,900 psi and excellent tear resistance, as well as its elastomeric properties, are said to enable the waterstop to withstand movements of masses of concrete without being sheared. Splicing is a simple matter of heating the ends to be joined and holding them together until they form a bond.

For further information on Durajoint and Duraseal waterstops, write to Electrovert, Inc., Dept. C&E, 489 Fifth Ave., New York 17, N. Y.

Circle No. 93.

Case history

Wrought-iron racks resist marine corrosion

Serious powerhouse turbine damage has been avoided for 20 years at the Missouri River's giant hydroelectric generating station at Fort Peck Dam in Montana, largely because of the amazing performance record turned in by corrosion resistant wrought-iron trash racks.

Forty-six of these racks were positioned at the entrance to four 24½-foot-diameter water intake tunnels, and were inaccessible for thorough inspection until just recently.

The only maintenance required for the wrought-iron racks—after two decades of resisting this marine-type

CONTRACTORS AND ENGINEERS

BETTER EQUIPMENT FOR PLACING AND FINISHING CONCRETE

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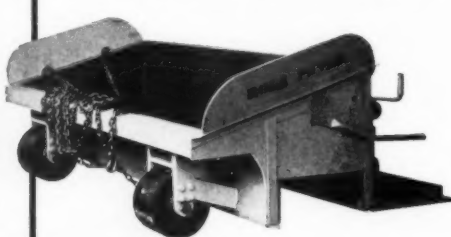
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Cmetco equipment is designed and built to help the contractor save time and money. Right through the Cmetco line it is easy to see that Cmetco engineers left outmoded design principles far behind. That is why Cmetco is fast becoming a leader in its field. Many of the new Cmetco innovations permit old field tasks to be done in much less time—because the new Cmetco equipment is easier for the crews to understand and use.

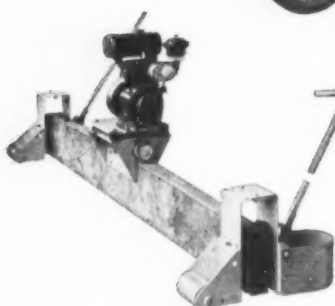
THE CMETCO POWER BUGGY needs no trained operators because it drives like an automobile. Operates and steers easy; goes forward or back instantly. Low on maintenance.



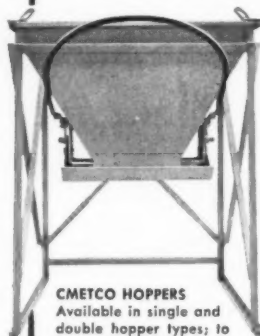
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THE CMETCO ROLA PAVER is today's most advanced and economical equipment for spreading base rock and asphaltic mixes. Helps get more work done per hour.



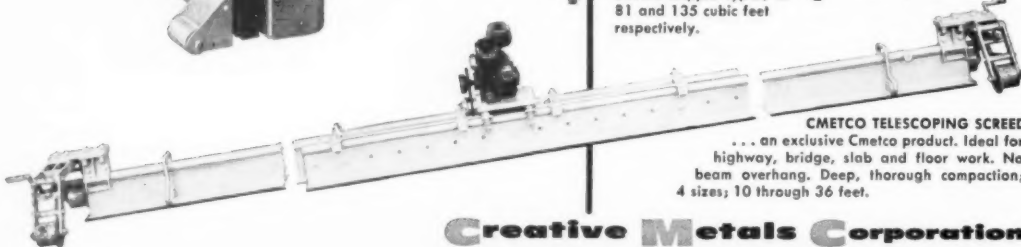
CMETCO ECONOMY SCREED permits contractors to build their own vibratory screeds any length.



CMETCO HOPPERS Available in single and double hopper types; to 81 and 135 cubic feet respectively.



CMETCO BUCKETS Sizes ½ through 2 cubic yards. Cmetco's exclusive self-cleaning, quick acting double clam shell gate is a feature on all Cmetco Buckets and Hoppers.



CMETCO TELESCOPING SCREED ... an exclusive Cmetco product. Ideal for highway, bridge, slab and floor work. No beam overhang. Deep, thorough compaction; 4 sizes; 10 through 36 feet.

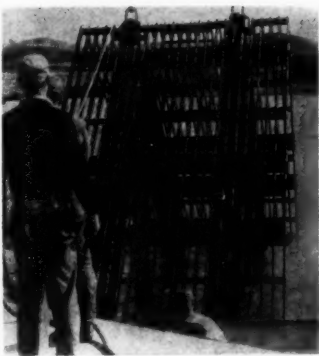
Creative Metals Corporation

1290 Powell Street, Emeryville, California • Olympic 3-8300

ASK FOR EQUIPMENT CATALOGS

For more facts, use Request Card at page 18 and circle No. 393

CM-44



One of 46 special wrought-iron trash racks at Fort Peck Dam which showed unusually good resistance to corrosion after 20 years under 60 feet of water.

corrosion—was a cleaning with high-pressure water spray.

Approximately 403 tons of 1x4-inch bars, angles, plates, and channels produced by A. M. Byers Co., Pittsburgh, were used by the St. Louis Structural Steel Co. to fabricate the all-welded trash racks, each of which weighs 25 tons. Each triangular-shaped wrought-iron rack was placed under 60 feet of water. Only occasional inspections were possible through the employment of highly-skilled deep-water divers.

In bringing the racks to the surface for their first complete examination, divers connected lifting equipment to lifting holes in the tops of the trash racks. They were then raised to the surface and put ashore.

Laboratory analysis of a small sample of tubercle material which had formed on the racks revealed that at no place where the bars had been scraped were the lites under the tubercles more than 3/32-inch deep. The analysis indicated the material was composed of silt, iron oxides, sulphates, carbonates, and carbon.

One observer present during the inspection described the racks as being in "excellent shape".

For further information on this corrosion-resistant metal, write to the A. M. Byers Co., Dept. C&E, Clark Bldg., Pittsburgh 22, Pa., or use the Request Card at page 18.

Circle No. 31.

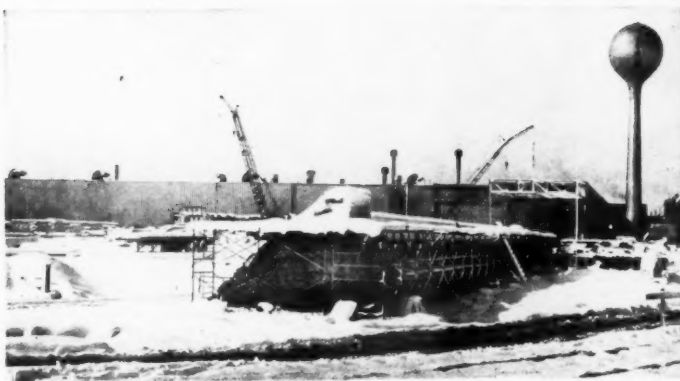
HRB report details night visibility

Bulletin 146, "Night Visibility, 1956", contains eight papers presented at the 35th annual meeting of the Highway Research Board. Topics discussed include accidents and highlighting in Indiana; validity of the night sight meter; the relation of sign brightness to position, distance, and reflectorization; and an experimental study of four methods of reflectorizing railway boxcars.

Other topics detail the effect of street lighting on the night traffic accident rate; a configuration of tail lights and brakelights; and principles and figures of merit for roadway lighting as an aid to night motor vehicle transportation.

The \$1.60 book is available from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C.

THE FIRST STEEL WORK for an addition to the Lincoln Electric Co., Cleveland, Ohio, plant is covered by a late April snow. The \$8,500,000 one-story building, which will cover almost 30 acres, will include storage space, manufacturing area for welding electrodes and machines, and a supply depot for Lincoln's 34 warehouses. The Austin Co. is engineer and builder of the new facility.



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easier than anything near its size!**

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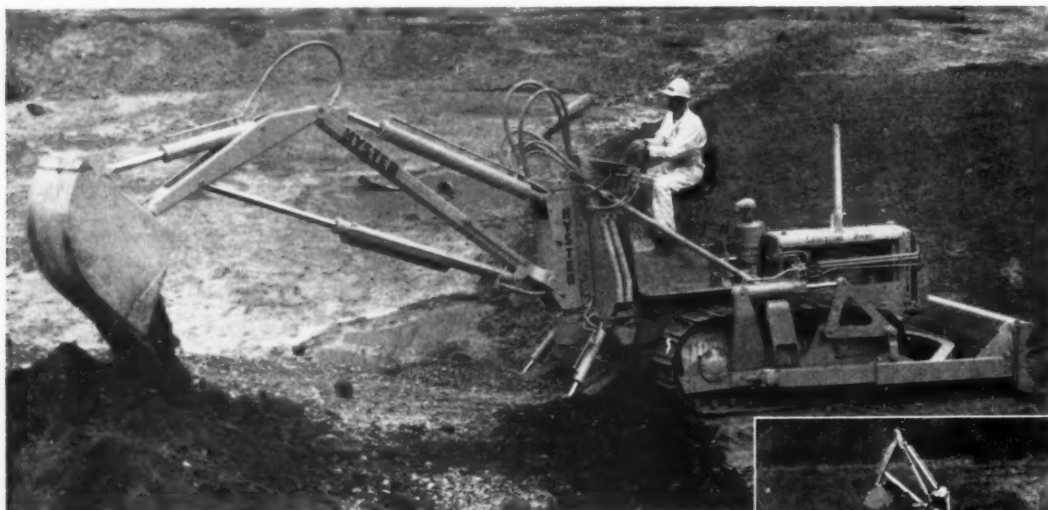
The 34-acre roofing job at the Chrysler Body Stamping plant in Twinsburg, Ohio, done with Lexsuo Roof Construction, is designed to give the facility added protection against costly fire losses.



Materials

and materials handling

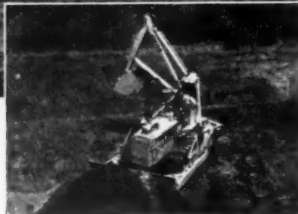
Special fire-protective roof for huge automotive plant eliminates some roofing steps to save time and cut costs



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D4 HYDRAULIC BACKHOE

combination backhoe and bulldozer



Using dozer blade, this machine clears way to job site, performs many rough-grading, leveling and back-filling chores without added equipment.

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Designed specifically for Caterpillar-built D4 Tractors.

Develops approximately 4 tons digging force at the teeth and balanced by tractor weight to use it all.

Simultaneous swing and hoist at full hydraulic pressures from separate pumps.

Large hydraulic capacity for continuous, all-day operation without overheating.

Track-type tractor mobility retained by exclusive patented equalizer arrangement.

Hyster's hoe, mounted on a Caterpillar D4 Tractor, will go anywhere to get at the tough jobs. It gives you all the advantages of a combination excavator-bulldozer with full track-type tractor mobility. Handles all kinds of utility trenching and digging jobs at low cost. Everything about this rugged machine is engineered for performance far beyond the capacity of other hydraulic backhoes.

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For more facts, use Request Card at page 18 and circle No. 395

Roofing a 34-acre area is an unusual job, but the special fire-resistive materials going into the roof of the 1,400,000 square-foot Chrysler Body Stamping Plant in Twinsburg, Ohio, are commanding attention in themselves. The same holds true for the mechanized equipment that kept the materials flowing from stocks to the point of application.

The complete roof consists of a Walcon steel deck, over which the Lexsuo fire-retardant materials were laid. These consist of a Koroseal vapor barrier and non-flammable Lexsuo adhesive made for Lexsuo, Inc., by B. F. Goodrich Industrial Products Co., Akron, Ohio. Over this, a 1-inch Fesco board roof insulation was installed and a 4-ply tar and gravel built-up roof placed.

Industrial Roofing & Sheet Metal, Inc., Cleveland, Ohio, roofing subcontractor for Hunkin-Conkey Construction Co., Cleveland, the general contractor, started roofing work on the high bay of the plant roof, which has two main levels.

With the steel deck in place, crews proceeded to lay the Koroseal vapor barrier in the morning, covering it immediately with the insulation. As soon as a large enough area had been covered, crews started mopping in the felts. Felt and gravel laydown were done in the afternoon so that the vapor barrier laid during the day could be completely covered at the end of the shift. When work finished for the day, all exposed edges of the insulation were given temporary protection.

Work mechanized

The big job was speeded by a number of machines. A 15-ton crane hoisted steel decking, insulation, felts, and gravel to the roof, while a power hoist handled all the remaining materials but the bitumen. The bitumen, brought from the Koppers Co. plant in 2,000-gallon tank trucks, was pumped to the roof by pitch pump through an insulated line.

Mechanization was also carried up to the roof. The Walcon steel deck, supplied by the W. Biddle-Walker Co., Detroit, Mich., was put down first. Then a rig that handled three jobs at one time laid the vapor barrier material.

Making one pass, this Lexsuo mechanical applicator put down a solid coating of Lexsuo Adhesive R 907 T to the underside of the Koroseal vapor

CONTRACTORS AND ENGINEERS

The complete roofing operation is confined to a small area. One man operates the Lexuoco applicator that coats the Koroseal vapor barrier with adhesive and secures it to the steel deck. Fesco board insulation, delivered in pallets, is then laid.



ding simplify operations on 34-acre roof job

barrier being unrolled from the machine, secured the Koroseal to the roof deck, and applied ribbons of adhesive to the Koroseal to secure the insulation. One man operated the rig, assisted by a helper. Both the Koroseal and pails of adhesive were supplied to this machine by Cushman power-driven scooters.

Industrial Roofing was able to schedule felt-laying operations early in the day, first, because only a minimum of time was needed to reload the applicator, and second, because the elimination of the conventional 2-ply mopped felt vapor barrier also did away with the need for asphalt, and the extra time and equipment needed to handle this material.

Gives protection

In eliminating the need for asphalt between the roof deck and insulation, this type of construction provides the plant with protection from costly fires that endanger life, destroy equipment, and cut into production time.

Tests by Factory Mutual Laboratories have shown that asphalt between the roof deck and insulation contribute to the spread of fire within a building. Fire reaching a roof, and generating enough heat to keep asphalt at a temperature of 800 degrees F, makes asphalt give off combustible gases that travel down through the roof deck and ignite, spreading the flames.

(Concluded on next page)



The mechanical applicator carries a well for Lexuoco Adhesive R 907 T, which is applied to the underside of the Koroseal vapor barrier being unrolled.

For more facts, circle No. 396

JUNE, 1957

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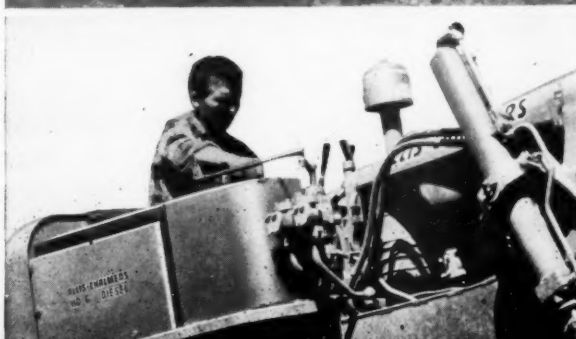
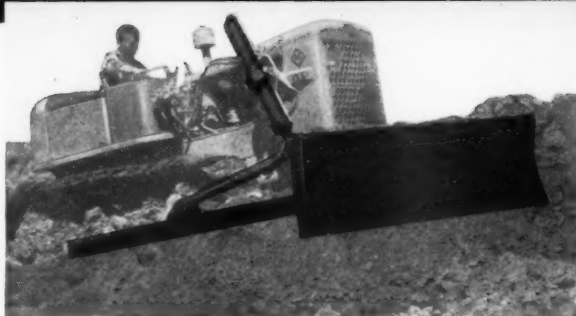
ALLIS-CHALMERS

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**MORE POWER—BETTER DOZING SPEEDS—
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Only dozer of its size with these basic advantages . . . engine-mounted rams, long push beams, fewer linkage points (only 2 instead of 5 or 6). These big-dozer features all combine to provide more accurate, gouge-free dozing . . . longer equipment life.

Convenient rotary-valve blade control makes the HD-6 the easiest handling dozer of its size. With more than 5½ feet of track on the ground, it has outstanding flotation . . . yet turns easily in any terrain. The HD-6 also combines large, low-set front idlers with a blade snugged close to the radiator guard . . . to provide balance that means better dozing, more work done under any conditions!

You can see it . . . but
there's only one way to
prove it—on **your** job!



Mechanization is evident throughout every step of every operation. The crane loading gravel to a bin on the roof also hoists steel decking, insulation, and felt to the top of the building. A power hoist handles remaining materials.

Gravel is picked up by a Cushman power-driven scooter on the roof. These rigs also brought Koroseal and adhesive to the machine laying the vapor barrier, and pitch from a pipe terminal at the roof to the mopping crews.



(Continued from preceding page)

This type of vapor barrier also keeps water vapor from migrating up through the roof deck and into the insulated built-up roof, causing deterioration of the insulation, blisters, and other damage.

The coal tar pitch was furnished by Koppers Co., Inc., Pittsburgh, Pa.

Cost cut for builder

The Lexsco roof constructions, engineered and distributed by Lexsco, Inc., Cleveland, carries cost-saving from the contractor to the owner of a building. With this type of construction, and the need for automatic sprinkler protection predicated on the occupancy of the building, sprinklers can sometimes be eliminated entirely; in cases where sprinklers are required, fewer sprinkler heads may be needed per square foot and lower insurance rates may be possible for the owner and occupant.

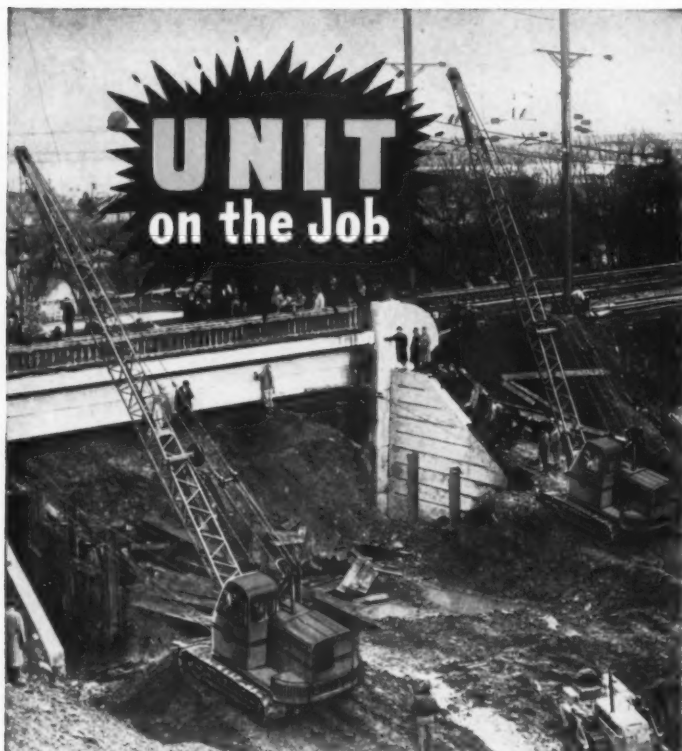
Other material handling

Never far behind the two-man crew applying the vapor barrier were crews installing the Fesco board roof insulation. Material handling was also mechanized for this operation. The insulation, supplied by F. E. Schundler Co., Inc., Joliet, Ill., and shipped to the job site in pallets for convenient handling, was carried to roof deck crews on mechanized carts.

As soon as this had been laid, the power-driven Cushman scooters—which kept the two-man crew supplied with Koroseal and adhesive—hailed insulated buggies of pitch from the pitch line to the point of application. Both the tarred felts and

This newest of Chrysler plants had F. A. Fairbrother and George H. Miehl, both of Detroit, as architect and engineer, with Albert Kahn Associates Architects & Engineers, also of Detroit, as the consultant firm.

THE END



UNIT on the Job

TEAMWORK and Accurate Control

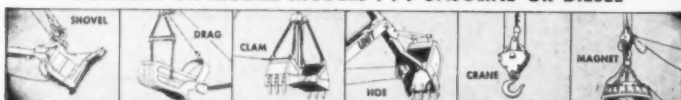
Working as a team, these two UNIT 1020 Cranes moved a 500 TON railroad bridge from its temporary mounting to the new structure in a period of thirteen (13) minutes. This type of job calls for smooth and accurate control of boom and hoist line operation. UNIT'S extra long crawlers, multiple-hinged shoes, wide axles, and hook rollers provide perfect balance and stability. This, together with the FULL VISION CAB for complete visibility, makes UNIT the machine that is dependable and safe to handle efficiently any type of heavy-duty work.

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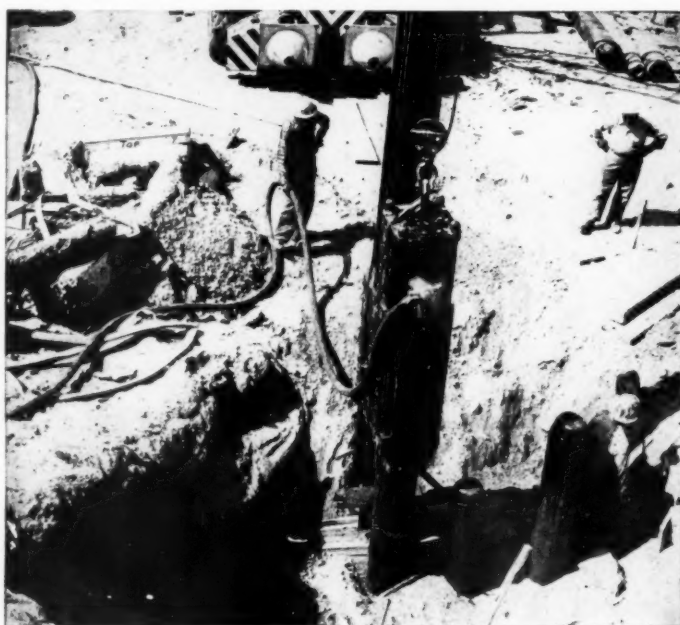


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CRAWLER OR MOBILE MODELS... GASOLINE OR DIESEL



All Models Convertible to ALL Attachments!

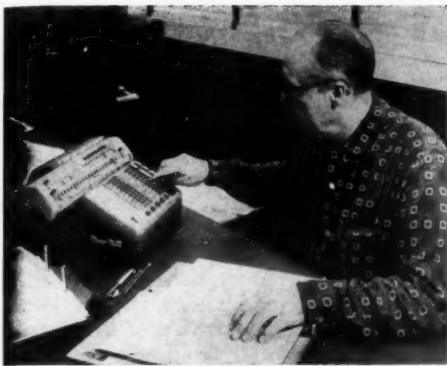
For more facts, use Request Card at page 18 and circle No. 397



Double-Acting McKiernan-Terry Pile Hammer driving wooden piles with alignment maintained by means of an H-beam spud and grapples fastened to the sides of the hammer. This method of holding a pile hammer is facilitated by the all-enclosed McKiernan-Terry design. McKiernan-Terry Corporation, 82A Richards Ave., Dover, N. J.

For more facts, use Request Card at page 18 and circle No. 398

CONTRACTORS AND ENGINEERS



Orville J. Rose combines several tax calculations on a Monroe-Matic computer in the payroll department of Public Constructors, Inc., Gloucester City and Runnemede, N. J. Both sides of the keyboard are used to figure FIC and UCC deductions in a single operation.

Case history

Calculator cuts paper work for contractor

Estimating, cost distribution, and similar computing jobs are simplified at Public Constructors, Inc., Gloucester City and Runnemede, N. J., using an office work tool—the automatic calculating machine. PCI uses a Monroe-Matic, a single keyboard calculator manufactured by Monroe Calculating Machine Co.

Although much of the estimating, cost distribution, and over-all control is centered at PCI's general offices in Gloucester City, there is a great deal of measurement computing and figure work handled at the various field offices. Other work is covered at projects—purchasing for individual jobs, invoices, and much of the figuring work for a 350 to 450-man payroll.

According to George Petti, chief office engineer, the simple operation of the calculator enables any engineer to master the machine quickly and to develop his own computing shortcuts. The light weight and small size of the unit permit it to be used on field trips.

The PCI office force has come to rely on the automatic calculators to cut the paper work load. The time consuming task of figuring pay, individual tax, and other deductions has been reduced by using both sides of the single keyboard to figure FIC and UCC deductions in a single operation.

For further information on these calculating machines, write to the Monroe Calculating Machine Co., Dept. C&E, 555 Mitchell St., Orange, N. J.

Circle No. 94

Goodyear conducts school on earthmover tires, rims

The Metal Products Division, Goodyear Tire & Rubber Co., Akron, Ohio, is conducting a series of schools to familiarize tire dealers and large equipment owners with the latest techniques in servicing large earthmover tires and rims. Three schools, operating in the East, Midwest, and West, are being conducted by Goodyear rim engineers.

Techniques on mounting and dismounting earthmover tubeless tires from tubeless rims are demonstrated, and the latest methods of trouble shooting and field correction are explained. A portion of the training school is devoted to an explanation of the federal highway program, and its effect on dealers.

Statically indeterminate structures topic of text

"Fundamentals of Statically Indeterminate Structures", by Carl L. Shermer, is a college textbook that develops the subject as a whole, rather than as a consideration of numerous unrelated methods. Topics covered in the book include an analytical determination of truss deflections; statically indeterminate trusses; the Williot-Mohr diagram; and deflection of beams.

The remaining chapters discuss

statically indeterminate beams; rigid frames, arches, and rings; slope deflection; moment distribution; influence lines; and plastic yielding and ultimate strength. Diagrams, formulas, tables, and equations supplement the written material. Problems and answers are listed at the end of each chapter.

Priced at \$6.50, the book is available from the Ronald Press Co., 15 E. 26th St., New York 10, N. Y.



Bucket teeth and ripper available at extra cost.

TEETH AT BOTH ENDS* BOOST PROFIT!

Production really steps up when this working team moves in—the Allis-Chalmers HD-6G tractor shovel with replaceable bucket teeth and rear-mounted ripper. Here's a job-proved combination engineered by the company that pioneered modern tractor shovels for the construction industry.

When the hydraulically controlled ripper bites in, even hard blacktop has to give. With the help of teeth at the front end, too, tough material is loosened and broken up for fast, easy loading—a full bucket every time.

You get more work done in less time because the heavy-duty HD-6G is designed for tough jobs. With 72 net engine hp and six-truck-wheel stability, it offers performance that means efficient production, bigger profits for every hour on the job.

These important advantages are also available on bigger Allis-Chalmers tractor shovels—the 2½-yd HD-11G, the 3-yd HD-16G, and the 4-yd HD-21G ... to help you meet the needs of your tractor shovel jobs profitably. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

Engineering in Action

For more facts, use Request Card at page 18 and circle No. 399

All-bolted 38-story office building represents new high in efficiency

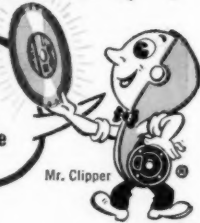
Ramset powder-actuated tools are used to fasten curtain-wall anchors to spandrel beams on the all-bolted Tishman building at 666 Fifth Ave., New York City.



CLIPPER Sells MORE... Because CLIPPER Sells **QUALITY!**



Call Us For A FREE
Demonstration By A Clipper
Factory-Trained Representative



**25 H. P.
Self-Propelled**

**Cut MORE Concrete
at LOWER Cost!**



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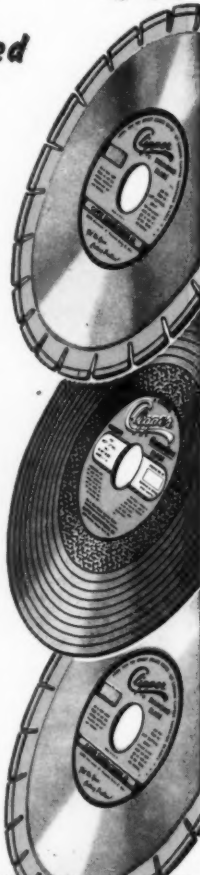
25 H. P. Gasoline Powered,
Gasoline or Electric Models
available from 1 1/2 to 36 H. P.

Clipper's SIMPLE design... RUGGED construction... DEPENDABLE performance give you a fast powerful Concrete Saw for heavy production cutting on all concrete and asphalt jobs. EXCLUSIVE Clipper features include SELF-PROPELLED unit with ABRASIVE COATED DRIVE WHEELS and rear wheel drive for powerful forward thrust. POSITIVE SCREW FEED—a "Must" when using low-cost "Green-Con" Abrasive Blades to compensate for diminishing blade diameters. Protects valuable diamond blades from bumping and scraping. A Positive Control AT ALL TIMES!

CLIPPER BLADES for EVERY JOB

Use Genuine CLIPPER DIAMOND Blades for Cutting Cured or Green concrete and asphalt with any aggregate. CLIPPER "GREEN-CON" Abrasive Blades for cutting "green" Concrete. There is a Clipper Blade for ALL Your Jobs.

Ask for **FREE
DEMONSTRATION
TRIAL**
on Your Job!



USE GENUINE CLIPPER BLADES—Diamond & Green-Con Abrasive

DIAMOND BLADES for any job—any aggregate—every saw! Choose your Clipper Diamond Blade from a wide variety of specifications to cut green or old concrete with outstanding speed and economy.

GREEN-CON ABRASIVE BLADES give you savings as high as 80%—with completely new series of "Green-Con" Reinforced Abrasive Blades that cut "Green concrete" with the widest possible range of HARD to SOFT Limestone Aggregates.

KANSAS CITY, MO.

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Better Mail the Coupon NOW!

CLIPPER MANUFACTURING CO.
2819 E. Warwick • Kansas City 8, Mo. 425X

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 ☐ Send FREE literature on Clipper Masonry Saws and Blades

☐ Send FREE literature on Clipper Concrete Saws and Blades
 ☐ Have a Clipper factory trained representative call on me.

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ADDRESS _____

CITY _____ STATE _____

For more facts, use coupon, or Request Card at page 18 and circle No. 400

A milestone in skyscraper construction history was passed recently at 666 Fifth Avenue in New York City with the completion of the steel framework for what will be the world's largest all-bolted office building.

For nearly seven months—beginning September 24, 1956, and ending April 18, 1957—a total of 13,000 tons of steel columns and beams was gradually assembled into a skeleton for a 1,050,000-square-foot, 38-story building. Conspicuously absent throughout the construction was the pounding riveting racket long associated with such operations.

Work in adjoining Rockefeller Center proceeded normally as workmen on the skyscraper project quietly and speedily joined the massive steel members together with new-type high-tensile-strength bolts and nuts instead of the traditional rivets. The bolts were supplied by Bethlehem Steel Co.

The bolts, which have been successfully used for years in bridge and industrial plant construction, have been slow to appear in Manhattan because of the building code which had limited bolted structures to a height of 125 feet. The code was changed on July 30, 1956.

Since then, builders have been using the new technique with greater frequency in apartment buildings as well as office structures.

Represents "trend"

According to Robert V. Tishman, executive vice president of Tishman Realty & Construction Co., Inc., which is erecting the skyscraper between 52nd and 53rd Streets, the trend toward the use of bolts was a natural development.

"The bolting technique is replacing riveting on many new jobs," Mr. Tishman points out, "because of at least three factors. For one, it is easier and quicker to train men in the bolting technique than in the more demanding and time-consuming riveting operations. Secondly, the bolting technique is cleaner in that



Steelwork on the new building was virtually completed when this picture was taken.

CONTRACTORS AND ENGINEERS

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A two-man team as-
sembled and tight-
ened up to 400 bolts
in one working day
on the new 38-story
office building.



It does not require heavy and haz-
ardous equipment. Thirdly, and of
extreme importance in a busy office
district, bolting sharply reduces the
noise which seriously interferes with
normal business operations in ad-
joining office buildings."

Mr. Tishman also stresses the time
and labor factor in the bolting oper-
ation. A two-man team can assemble
and tighten approximately 400 bolts
in one working day, whereas the
average four-man riveting crew can
place only about 300 rivets.

The bolts used in the Tishman
skyscraper vary in size generally
from 1/2 inch to 1 1/4 inches in diam-
eter, depending upon the size of the
structural steel members to be
joined. After the holes in the steel-
work were aligned, the bolts were in-
serted and the nut run by hand. Har-
dened steel washers were used at
the head of the bolt and at the nut.
When all the bolts in a particular
connection were in, the nuts were
tightened by an impact wrench, pre-
viously calibrated to the correct ten-
sile load.

Speed in assembly

It takes about 10 seconds under
normal air pressure setting to tighten
a nut. One man generally holds the
bolt head with a hand wrench, while
the other applies the impact wrench
to the nut. At the correct point, the
impact wrench lacks the power to
drive the nut tighter and its begins
to recoil and vibrate.

The impact wrench used in the
Tishman project was a new light-
weight model developed by the Chi-
cago Pneumatic Tool Co. The Beth-
lehem Steel Co. erected the steel
framework.

Ramset power-actuated tools are
being used to set the aluminum fa-
cade panels in place as they arrive
via piggy-back truck-rail shipment
from Louisville, Ky.

Planned for November occupancy,
the skyscraper is exactly on schedule.

THE END

New Sherman division

Sherman Products, Inc., Royal Oak,
Mich., has created the Spartan Divi-
sion to increase the base of its opera-
tions and outlets, and permit econo-
mies over the entire line of products.
The first product of the Spartan Di-
vision is to be a front-end loader de-
signed for medium-size tractors.

For more facts, use coupon, or circle No. 401→

Md. road commission ends trail blazer contest

The Maryland State Roads Com-
mission has ended its trail blazer con-
test for the Baltimore Harbor Tunnel.
The winning trail blazer will be
erected on Baltimore City streets,
principal highways leading to the
tunnel, and in nearby states. The
contest was open to all residents of
Maryland.

The 24-inch sign will have 3-inch
letters in white, black, red, green,
blue, or yellow. The submitted sign
was sketched one-half the actual size,
the winner to complete the design. A

directional arrow will be incorporated
in the sign or be a separate 12-inch
sign to be mounted below the trail
blazer.

Winner of the \$250 prize has not
yet been announced.

P&H appoints Jacobson

Paul Jacobson has been appointed
excavator salesman for the Philadel-
phia, Pa., office of the Harnischfeger
Corp., Milwaukee, Wis. Jacobson will
handle the sales of all Construction
and Mining Division products to com-
mercial markets and also to federal
agencies.

You can see it, but there's
only one way to prove
what the **HD-6** can do for you!

**Call your nearby
Allis-Chalmers construction machinery dealer
—he'll demonstrate one on your job NOW!**

**Allis-Chalmers
Construction Machinery Division**
Milwaukee 1, Wisconsin

Gentlemen:

Please have the Allis-Chalmers construction machinery dealer
serving my area arrange a demonstration of the HD-6 tractor-
dozer for me.

Name _____

Address _____

City _____ State _____

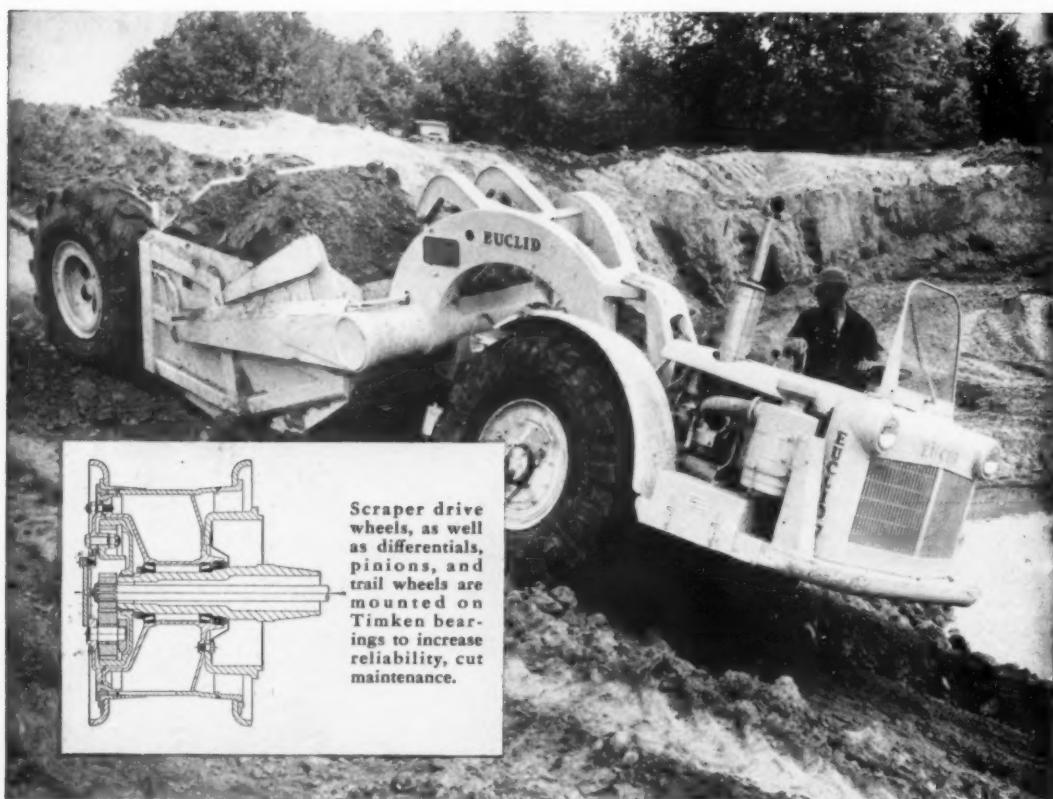
Type of Work _____

... or send us this



First use of tetrapods made in U. S. on long breakwater

At the circular casting yard, tetrapods in various stages of construction surround the Noble batch plant that turns out concrete for the 25-ton structures. In the background is the Crescent City breakwater on which the tetrapods are being used.



Scraper drive wheels, as well as differentials, pinions, and trail wheels are mounted on Timken bearings to increase reliability, cut maintenance.

Laughs at tough scrapes... with TIMKEN® bearings to roll the load

SCRAPERS are well known for their rugged dependability. How do they get that way? One big factor is Timken® tapered roller bearings. Pictured above is a typical overhung scraper taking a load over a stiff slope. In wheels, pinions, and differentials, you'll find Timken bearings in scrapers up to 518 horsepower and 24 yards capacity.

Timken bearings are first choice with makers of earth moving equipment because they supply the dependability that keeps machines on the go. Their tapered construction permits them to take radial and thrust loads or any combination. They practically eliminate friction, making heavy loads easier to move. Timken bearings are geometrically designed

to give true rolling motion—precision-manufactured to live up to their design.

Timken bearings keep shafts and housings concentric to maintain positive closures. Dirt stays out, lubricant stays in to insure longer life, keep breakdowns to a minimum. Case-carburizing of Timken bearings gives them hard, wear-resistant surfaces over tough, shock-resistant cores. That's one big reason Timken bearings normally last the life of the machine.

We even make our own steel to make sure it's the best. No other American bearing manufacturer does. Make sure you get all these advantages in the machines you build or buy. Always specify Timken tapered

roller bearings. Look for the trademark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".



This symbol on a product means its bearings are the best.



TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS ROLL THE LOAD

For more facts, use Request Card at page 18 and circle No. 402

A material of construction new to this country—though it has been used in other parts of the world for several years—is providing the means of strengthening the breakwater at Crescent City, Calif.

The material is the tetrapod, a four-legged geometric shape in concrete that resembles a child's jack. Developed by French engineers, these shapes have proved effective in various installations, and right now, 13-foot high tetrapods are giving a good account of themselves at Kahului Harbor on the island of Maui in the Hawaiian group. (See "New Breakwater Facing Method to have Roughest Test in Hawaii", C&E, Feb., 1957, pg. 152.)

As was the case at Kahului Harbor, the breakwater at Crescent City, just south of the Oregon state line, had been repaired over and over again during the course of years, following storms that damaged the installation.

The present job, being done by the U. S. Army Corps of Engineers, calls for an outer-wall armor protection of the breakwater with precast tetrapods. Approximately 1,000 of the units, 10.5 feet high and weighing 25 tons each, are being fabricated by Peter Kiewit Sons' Co., Omaha, Nebr., the general contractor on the \$1,300,000 job.

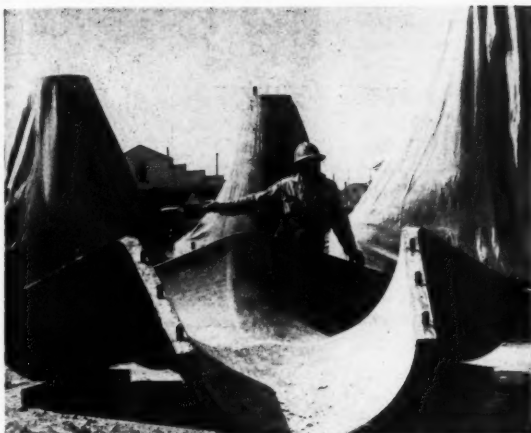
Two layers of the tetrapods are being placed on the 4,200-foot-long breakwater's seaward side, which takes the full force of the Pacific. The remaining portions of the structure consist of conventional 12-ton Class A derrickstone, placed from elevation minus 10 to elevation plus 10, and some smaller core rock. This construction is expected to give the breakwater enough strength to withstand the hydraulic pressures set up along the coast.

Tetrapod advantages

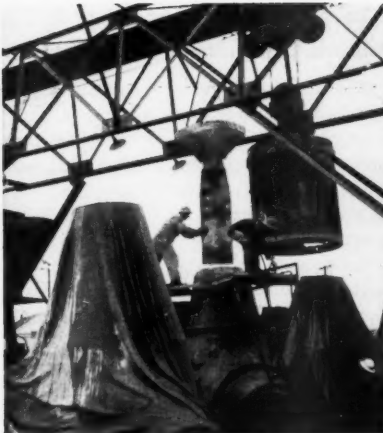
While the use of tetrapods is saving time in the construction of the breakwater, and saving money over the alternate method of quarrying rock for the breakwater, they also have a number of advantages that make them most suitable for this job.

The odd shape of these units reduces the total volume of rock and

CONTRACTORS AND ENGINEERS



The lower half of a tetrapod form is in position waiting for the remainder to be placed. End sections for the legs and a top section, weighing 3,400 pounds, complete the form.



The shop-erected gantry moves a Gar-Bro 4-yard bucket to the elephant trunk used during a pour.



A workman loosens the nuts that hold top and bottom sections of the form together. The forms for the 10.5-foot-high units were made for this job by Berkeley Steel Construction Co., Berkeley, Calif.

concrete needed for the breakwater, providing a money saving that more than compensates for the expense of building forms for the shapes. Since tetrapods weigh less than conventional blocks or derrickstone that would be required for the same area, they are easier to handle and install. They may be placed under water without assistance from a diver. Moreover, they do not have to be placed carefully; they have a low center of gravity and wave action tends to knit the tetrapods tightly together instead of breaking them apart. Their shape also dissipates wave energy, prevents a breakwater from being overtopped, and yet leaves voids so that back pressure is reduced.

The tetrapods being cast at the Crescent City site stand about 10.5 feet tall and are 12.5 feet wide between end faces. Since sheer mass, weight, and shape give the tetrapods the desired qualities for the breakwater job, they are cast without reinforcing steel in special all-steel forms.

Seven sets of forms, designed and built in Berkeley, Calif., by Berkeley Steel Construction Co., Inc., are used to meet the ambitious five-day-week, double-shift schedule.

A form consists of a matched set of five bottom pieces and one top piece. The bottom half of a steel form weighs 2,200 pounds. The single piece top half of the form, weighing 3,400 pounds, is an improvement over the three-part top shell used when some of the first tetrapods were cast in France. Because of the one-piece construction of this top half, a good many man-hours of labor are being saved on jobs as big as this one. The single piece also goes into place faster and can be handled almost as easily as the smaller sections. When a tetrapod is ready to be stripped, the top half is simply and easily lifted off the precast shape.

Concrete work

The concrete casting yard is on the beach near the Crescent City breakwater, and completed tetrapods are stored here until they are needed on the breakwater.

Concrete is turned out by a Noble
(Concluded on next page)

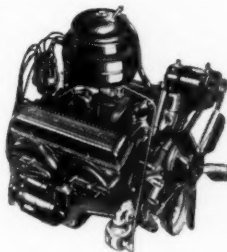


POWERFUL REASONS WHY A CHEVROLET STAYS ON THE JOB...SAVES ON THE JOB!

COMPACT CHEVY V8

(weighs up to 150 lbs. less than others)

- Shortest stroke of any truck V8
- Short, durable connecting rods
- Vertically compact cylinder block
- Rugged yet light crankshaft
- Efficient hydraulic valve lifters



- Long-wearing Moraine bearings

Chevrolet trucks are powered by V8's that make every ounce count. Because of their trimmed-down design, they use less power to haul their own weight and put more power into hustling your cargoes. Like all Chevrolet truck components, these engines are efficient performers—and that means top economy and dependability!

Chevy's the dollar saver *de luxe* of the American road, and many of the reasons why can be found beneath the Chevrolet truck hood. That's where you'll often find a great V8 that's at the head of its class for compact, efficient short-stroke design. You won't find features to equal all those listed here (at left) in any other truck V8's today. Or, if you prefer a 6, Chevy's got the most popular 6-cylinder powerplants in the history of hauling. They're honest-to-goodness truck engines, specially built to stay and save on rough, tough hauling jobs.

You'll find that a Chevrolet truck gives you so much to save with! Your Chevrolet dealer is waiting to fill you in on all the facts. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

Biggest sellers . . . because they're biggest savers!



CHEVROLET TASK-FORCE 57 TRUCKS

For more facts, use Request Card at page 18 and circle No. 403

(Continued from preceding page)

150-ton semiautomatic batcher. Batches are discharged into a Foote 34-E paver that has the conventional dump bucket removed so that it can dump mixed concrete into a pair of Gar-Bro 4-yard buckets. These, in turn, are handled by the gantry cranes that serve the area. A commercial firm, Pelican Bay Construction Co. is supplying aggregates to the job from Smith River, about eleven miles away. Bulk Type II portland cement is also being used in the concrete mix, which has these proportions:

Material	Per cent by weight
Type II portland cement	1.00
Mixed and graded sand	1.61
No. 4 to ¾-inch aggregate	1.77
¾ to 1½-inch aggregate	1.90
1½ to 3-inch aggregate	2.66
Water	0.41

The mix, made with Protex air-entraining agent, takes 4.82 sacks of cement per cubic yard. The water-cement ratio is 4.65 gallons per sack. A one per cent calcium chloride accelerating agent also is being used to hasten initial hydration and allow the single-piece top half of each form to be removed 8 hours after concrete has been placed. The bottom half is stripped 2½ days after concrete placement.

Serving the 400-foot diameter yard is a shop-erected gantry that moves the completed Tetrapods. As form setting is completed for each unit, the crane also makes the 12½-cubic-yard pour and men use internal-type Viber electric vibrators to consolidate the concrete.

Core rock production

Production of core rock is a much more conventional operation. This job has been subcontracted to D. C. Toye Co., Portland, Oreg. Toye has opened up a quarry near Crescent City where rock is suitable for a breakwater core but not for armor-

ing. Drilling at this quarry is handled by Ingersoll-Rand compressors and Ingersoll-Rand Jackhamers and wagon drills. As material is loaded out to Euclid end-dumps by a shovel for transport to barges and the breakwater, a Cat D8 cleans up around the pit floor.

Personnel

Supervising the project at field level is Gordon W. Stark, resident engineer of the North Coast regional office of the San Francisco Engineer District. Col. John A. Graf, district engineer, has over-all charge of the project. He is assisted by H. A. Flertzhelm, Jr., North Coast projects engineer for the SED office, who will leave the job for a new assignment before the breakwater is completed this coming season. **THE END**

To obtain further information on any of the products described in these pages, circle the number given at the end of the item on the Request Card at page 18.

Case history

Multi-use plastic film shaves material costs

Film made from Bakelite polyethylene is being put to a number of uses by the contractor on a large housing development project in Carpenterville, Ill., with the result that materials costs are being kept down and efficiency is at a high level.

In addition to its use as an effective vapor barrier in the housing units themselves, Visqueen film is finding application on this big job as a protective covering for newly poured concrete. Lumber and other materials stockpiled at the site are covered with

the film and thus protected from the elements.

Finally, large sheets of the film have been used to enclose partially-completed units, thus affording both the unfinished work and the contractor's workmen protection from sudden storms.

For further information on the uses of Visqueen film write to Visking Co., Dept. C&E, Terre Haute, Ind., or use the Request Card at page 18.

Circle No. 28.



One of the many uses of Visqueen film is as a protective covering for stockpiled building materials.

Costs of city work seem too high?

LOOK HOW

SANGAMO CONSTRUCTION CO.

CUTS THEM

This well-known 30-year-old Springfield (Illinois) firm, a year ago, had a problem common to most city-area contractors. Moving costs and traffic slow-downs were taking much of the profit out of their municipal work. Small, extra, one-day or weekend jobs, which *could* have built income, often couldn't be handled because, like many contractors, their equipment was either too small or too big. Sangamo, however, found a solution. They bought Michigan Tractor Shovels. Today, their \$3,000,000 annual volume is *largely* in city work and *three* of their busiest, most profitable machines are Michigans.



Drive, turn non-stop on narrowest city streets

All these units can be on their way to any kind of loader job in minutes. "These rigs go anywhere," says Clyde Turner, one of Sangamo's job superintendents. "They can run three or four blocks, through auto and truck traffic, in a minute or so. Twenty-seven miles takes only an hour. Rubber tires don't tear up asphalt or oil-mat pavement. They can even go up on a sidewalk without breaking it or the curbing. And our Model 75A's (which are 6' 8" wide and 16' 10" long) can turn around non-stop on the narrowest city streets."



Does job of bigger machines setting 12 inch sewer pipe

Often, one of the Michigans is assigned to a major job where maneuverability is a vital factor in speeding completion. Above picture shows typical task of this type—laying eight miles of 8, 10, and 12-inch sewer pipe for the city of Decatur (Illinois). Daily—almost hourly—this Model 75A shuttled between *three* crews. Tasks included pushing spoil away from trencher . . . back-filling . . . transporting and laying pipe. At times, it set manholes weighing 1200 to 1500 lbs per ring section. Biggest advantages proved to be speed (a typical half-mile trip took 75 seconds) . . . rugged construction (in a summer of work, no time was lost from the job for repairs) . . . planetary axles (which eliminated all axle breakage despite rugged lifting demands)

avoid legal pitfalls

Picketing not enjoined

THE PROBLEM: A contracting firm and its subcontractors employed non-union men. The firm did not prevent the men from joining unions. At great loss to the firm, unions peacefully picketed a construction site, refusing to let union drivers of supply trucks cross the picket line. Was the firm

entitled to an injunction against the picketing?

THE ANSWER: No. (*Amore v. Beaver County Bldg. & Construction Trade Council*, 126 Atl. 725, decided by the Pennsylvania Supreme Court.)

The court said that peaceful picketing in such a case is unlawful if designed to coerce the employer to compel his employees to join a union, but not if it is merely intended to persuade them to do so.

The decision was influenced by the facts that the pickets did not enter upon the construction site to talk with workers there after a "No Trespassing" sign had been erected.

Subcontract termination considered unjustified

THE PROBLEM: The defendant had a subcontract to furnish structural steel for state buildings. The agreement provided, however, that the plaintiff, the prime contractor, could terminate the contract should the subcontractor refuse or neglect to supply sufficient materials. The subcontractor wrote a letter to the prime contractor in which he stated that obtaining steel was difficult because of a shortage, and asked the contractor's assistance in getting the materials. Did the letter constitute such a breach of

Edited by A. L. H. STREET Attorney-at-Law

These brief extracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

contract as to justify the prime contractor in suing for damages, on the theory that the subcontractor had indicated that it would not carry out its agreement?

THE ANSWER: No. (*McCloskey & Co. v. Minweld Steel Co.*, 220 Fed. 2d 101, decided by the United States Court of Appeals, Third Circuit.)

The case was governed by a Pennsylvania law to the effect that a contracting party's renunciation of his agreement can be treated as a breach of contract only if there is an absolute and unequivocal refusal to perform or a positive admission of inability to perform.

Bond did not cover welfare fund contribution

THE PROBLEM: A federal statute requires general contractors on public-work contracts, involving more than \$2,000, to give bond for the payment of all persons supplying labor and material. By a collective-bargaining agreement between a union and a contractor, the contractor was bound to pay 7½ cents for each hour worked by employees into a health and welfare fund. He failed to do so, and later became bankrupt. Was the surety on the bond liable for the delinquent payments into the fund?

THE ANSWER: No. (*United States v. Carter*, 229 Fed. 2d 645, decided by the United States Court of Appeals, Ninth Circuit.)

The court said that the payments to be made into the fund on behalf of the employees could not be regarded as part of their wages, the payment of which was secured by the bond. This was so even though the agreement for contributions by the contractor was part of the collective-bargaining agreement.

An employment contract

THE PROBLEM: Contractors operating in Okinawa engaged the personal services of a New Yorker under a written contract prepared and signed at the contractor's offices in San Francisco, Calif. The contract specified that the employment was terminable at will and that it contained all of the agreement between the parties. Allegedly, the employee gave up a business in New York and went to San Francisco to sign the contract. The New York agents of the contractor had assured him that the contract to be signed would grant him at least one year's employment. The employee went to Okinawa but was discharged in less than a year. Did he have any right to damages against the contractor?

THE ANSWER: No. (*Davis v. Guy F.*



Carries 1800 lb water main section

Bigger loads have been no problem for the Michigans, either. Above, the second of Sangamo's 80 hp Model 75A's carries an 1,800 lb, 18 ft section of 20 inch water main. This unit can lift 8,000 lbs while standing still... can carry 4,000 lbs at 4 mph.



Full buckets are the trademark of all Sangamo's Michigans. Here the Model 125A, bin-storing hot mix material, carries more than its rated 2 yard capacity. Unexcelled breakout force, low-level tipback, and low-level-carry result in the delivery of big loads every time, the operator says.

Stockpiling gravel is another job for the busy Model 125A. While at this city-located yard, rig sometimes loads trucks and railroad cars, feeds the crusher, does cleanup. Its standard 2 yard bucket, incidentally, is interchangeable with either 1½ or 2½ yard buckets.



The model 75A's standard 1¼ yard bucket interchanges with ¾ and 2 yard sizes. Both models can also be equipped with crane hooks, fork lifts, backfiller blades, scarifiers and root rakes. For small jobs you can get a Michigan Model 12B with 6, 10, 16, 20, or 27 cubic foot capacity... for big jobs you can get a Michigan Model 175A with 1½, 2¼, 2¾ (standard), 3¼ or 5 cubic yard capacity. For help in determining which of these four models, or which of their 35 different buckets and attachments, best fits your needs, ask one of our job study engineers to study your layout. Feel free to call or write us any time for this service. It's free, of course and realistic... and will put you under no obligation whatsoever.

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Construction Machinery Division
2407 Pipestone Road
Benton Harbor 27, Michigan
In Canada: Canadian Clark, Ltd.
St. Thomas, Ontario

For more facts, use Request Card at page 18 and circle No. 404



Clears, loads 1,000 yards of rubble in 1½ days

Sangamo's third Michigan Tractor Shovel, a 95 hp, 2 yard Model 125A, also handles assignments where speed is important. Here it's on a historical job in Springfield—clearing the wreckage of Illinois' first governor's mansion to make way for a parking lot. Entire 1,000 cubic yards of rubble and dirt was piled and loaded out in 1½ days. Sangamo Construction bought this machine, their first Michigan Tractor Shovel, after having it demonstrated (to quote Company President, Bill Kewley) "on the toughest tractor shovel work we could find—digging up wet rocky ground to improve drainage around a Springfield sewage treatment plant. Later," Kewley continues, "it proved so handy and so dependable, all our crews wanted one. So, in 5 months, we bought our second Michigan, and 3 months later, our third."

Avoid legal pitfalls

Atkinson Co., 222 Fed. 2d 824, decided by the United States Circuit Court of Appeals, Ninth Circuit, San Francisco.)

The court indicated that had the employee refused to sign the written contract, he might have had a good claim for damages covering his giving up his business in New York and the expenses of the trip to California. But he lost that right by signing the written contract, particularly since it stated that there were no agreements between the parties except those specified in writing.

Falling barricade injures pedestrian

THE PROBLEM: Ordinarily, one who claims damages for personal injury must show that the defendant was negligent in some specific respect. But there is an exception to the rule, when the thing causing the injury was under the control of the defendant and the accident was not of such nature that it would have been apt to have happened had the defendant been careful. This rule was involved in a case where a contractor erected a barricade on a public sidewalk in front of a construction site. It was 10 to 12 feet high and 16 feet long, consisting of plywood and 2x4 plates and studs bolted to the sidewalk and anchored to a building by wires. Affected by rain, sleet, and wind, the barricade fell upon the plaintiff, a pedestrian. Did the accident require the contractor to prove that the fall was not due to negligent construction of the barricade?

THE ANSWER: Yes. (Albin v. T. F. Barrett Construction Co., 232 Fed. 2d 501, decided by the United States Court of Appeals, Seventh Circuit.)

Revocation of contractor's license set aside by court

THE PROBLEM: The California Contractor's State Board decided that a contractor had illegally diverted an owner's funds, illegally departed from plans and specifications, violated building laws, and was guilty of willful and fraudulent violation of other persons' rights. His license was revoked without indicating that the order was based on any one or all of the four separate charges. The court decided that there was not sufficient evidence to sustain the Board's finding that the contractor had wrongfully diverted construction funds. Was the contractor entitled to a court order requiring the Board to reconsider the penalty to be imposed?

THE ANSWER: Yes. (Hutchinson v. Contractors' State License Board, 300 Pac. 2d 216, decided by the California District Court of Appeal, Second District.) In short, it could not be assumed that the Board would have imposed so severe a penalty as revocation, except for its finding that there had been an illegal diversion of funds.

Bribed inspectors

THE PROBLEM: A California statute makes it a felony for any state, county, or municipal employee to ask or receive a bribe. Were city building inspectors punishable under this law if they received payments—under threat from subcontractors—to require work that had been defectively performed, or that had been completed in violation of the requirement for progress inspection, to be done over again?

THE ANSWER: Yes. (People v. Walsh, 301 Pac. 2d 247, decided by the California Supreme Court.)

The court decided that checks of the subcontractors, payable to cash, and the proceeds allegedly paid to the inspectors, were receivable in

evidence on trial of the inspectors. It could also be proved that one of the accused inspectors had refused to testify before the grand jury which indicted him, because of fear of self-incrimination, even though he did so on the advice of his attorney.

Delay claim waived

THE PROBLEM: Subcontractors' work was delayed by the prime contractor until after the agreed performance time had passed. But, without complaining, the subcontractors proceeded and partly performed their subcontract. Could they refuse to fully perform on account of having been delayed?

THE ANSWER: No. (Lichter v. Goss,

232 Fed. 2d 715, decided by the United States Court of Appeals, Seventh Circuit.) This was so even though the work done amounted to but about 4 per cent of what was called for by the subcontract.

The court said that any right to refuse carrying out the subcontract because of the previous delay was waived when the subcontractors proceeded with the work without objecting to the delay and then chose to cancel the subcontract.

Bank outranks contractor

THE PROBLEM: Before work commenced, a prime contractor knew that a subcontractor was financially unable to carry on. Nevertheless, he wrote a letter to a bank inducing it

Highway viaduct demonstrates Threeke of fir plywoodco



Fir plywood solved complex form problem on Alaskan Way Viaduct. The 3/4 mile double-decked structure required only 400,000 square feet of plywood.

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Key advantages of concrete forms

1. time and labor savings

On this six-lane Seattle highway viaduct, standardized fir plywood form sections helped complete the job months ahead of schedule. Fir plywood forms were used for beams, girders and road slabs.

2. economy through re-use

About 400,000 square feet of $\frac{5}{8}$ " fir plywood was required for the $\frac{3}{4}$ mile double deck structure. Contractors reported an average of four re-uses. About 25% of the fir plywood forms gave 10 uses.

3. smooth, fin-free concrete

The smooth surfaces obtained with the plywood forms cut finishing to a minimum, the contractor reports. Job Superintendent John Rumsey, Jr. says: "Fir plywood solved a complex form problem for us and speeded work all along the line."



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INTERIOR PLYFORM®—standard concrete form grade made with moisture-resistant glue. Gives multiple (10-12) re-uses.

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ALASKAN WAY VIADUCT
LOCATION: Seattle, Washington
CONTRACTORS: Morrison-Knudsen Co., Inc.
Rumsey and Company

guities in written agreements should be construed against the parties who chose the wording.

Dealer did not guarantee tensile strength of rope

THE PROBLEM: An employer bought from a dealer some 11/16-inch rope for undisclosed use in supporting a scaffold. Due to latent defect in the rope not discoverable on inspection and which neither the dealer nor the buyer was aware, the rope broke, injuring the buyer's employee. Was the dealer liable to the employee?

THE ANSWER: No. *Phares v. Sandia Lumber Co.*, 305 Pac. 2d 367, decided by the New Mexico Supreme Court.)

The court said that there was no implied warranty by the dealer that

the rope could be used in supporting scaffolding. Since the use of the rope was not disclosed, the buyer could not be said to have relied upon the judgment of the dealer as to the rope's adaptability.

The court left undecided the question whether the injured employee could have availed himself of an implied warranty of fitness made to the employer had such a warranty existed.

Subcontractor was bound to furnish materials

THE PROBLEM: Part of the work of repairing river flood gates for the government was sublet. The subcontractor agreed to furnish all labor and materials needed, but the prime

contractor agreed to furnish new timber required by the subcontractor to replace rotten timber fenders. Was the prime contractor bound to furnish the bolts, nuts, and galvanizing required by this item of work?

THE ANSWER: No. (*Tower Contracting Co. v. Flores*, 294 S. W. 2d 266, decided by the Texas Court of Civil Appeals, Galveston.)

Workman's own fault that he was injured

THE PROBLEM: To install a pipe a subcontractor's workman climbed upon a crate that another subcontractor had left upon construction premises. He was injured when the crate tipped. There was a movable scaffold available for his use. Was the general contractor liable?

THE ANSWER: No. (*Oaxaca v. Lowman*, 297 S. W. 2d 729, decided by the Texas Court of Civil Appeals, El Paso.)

The court said the general contractor should have kept the premises clear of such debris as the crate, but failure to do so was not the real cause of the accident, but rather the workman's own choice of a feeble substitute for a safe scaffold.

Paving included curbs

THE PROBLEM: A New Mexico city council resolution provided that a certain street should be "graded, constructed, paved, and otherwise improved." Did the resolution authorize constructing curbs and gutters along the street?

THE ANSWER: Yes. (*Feldhake v. City of Santa Fe*, 300 Pac. 2d 934, decided by the New Mexico Supreme Court.)

The court referred to similar decisions that had been rendered by the appellate courts of Colorado, Iowa, Arkansas, Missouri, and New York.

Employees' meals, board not part of contract

THE PROBLEM: A motor court was erected under cost-plus contract. Was the contractor entitled to include the cost of room and meals for employees engaged on the work, not provided for by the contract?

THE ANSWER: No. (*Thorobread Motor Court, Inc. v. Allen Company*, 296 S. W. 2d 690, decided by the Kentucky Court of Appeals.)

City liable for damage from negligent blasting

THE PROBLEM: If a defendant city knowingly permitted a sewer contractor to endanger adjacent property by negligent blasting, could it be held liable for the damage?

THE ANSWER: Yes. (*Lundahl v. City of Idaho Falls*, 303 Pac. 2d 667, decided by the Idaho Supreme Court.)

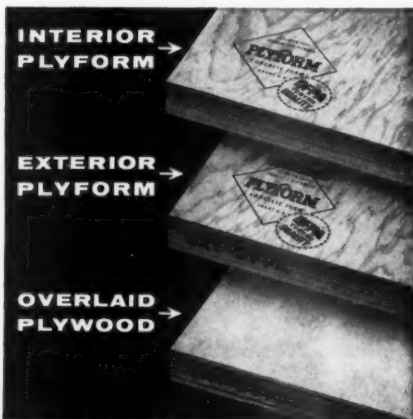
The court cited decisions of the courts of other states, showing that it is generally recognized that a municipality cannot escape responsibility in such cases on the theory that it is a governmental agency.



Beam and girder bottom forms were built up inside standard vertical form panels in what contractors called "floating beam bottoms," to handle variable beam and girder depths.



Pattern of plywood forms for girders and cross beams is shown here. Standard panels for shallow cross beams and shallow center beams were not as high as those for girders.



For more facts, use Request Card at page 18 and circle No. 405



Economical prestressing setup does fast job on girders, beams



Strands pass through plywood bulkheads, carried by the dolly, which will be positioned when strands have been made taut. The dolly straddles a plywood soffit—the bottom of the girder form. By alternating cable stringing and casting on the twin-alley beds, the contractor required only one set of forms.



Riding an overhead beam, a Speed-Wright electric hoist lifts the pulling template so that the dolly can be removed. The three sections are lifted simultaneously by means of a bar passing through the I-beams.

**Complete casting of 352 units handled with
one set of forms; work on components for
highway structures meets tight schedule**

by ANTHONY N. MAVROUDIS, field editor

To get around difficulties posed by an acute shortage of steel and doubt about deliveries, one contractor submitted an alternate bid for a 9½-mile Garden State Parkway extension contract that included 18 structures. This extension, scheduled to open to traffic next month, is designed to connect a short feeder route at the New York State line and provide a direct link between the Parkway and the New York State Thruway.

The alternate bid, based on the use of prestressed 26 to 72-foot-long bridge girders and beams, was substantially lower than the bid that specified steel work on the structures. And in this case, economy was accompanied by fast production that enabled Reid Contracting Co., Inc., Woodbridge, N. J., to complete the \$6,601,768 contract in little over a year.

A total of 352 prestressed components, consisting of two basic cross

The I-beams have been lowered into a cavity in the casting bed and bolted to a wide-flange section braced against the two main uprights. Reliable grips hold the strands to the I-beams.



Workmen position 30-foot-long sections of forms along a lane. Equipped with removable inserts to form any cross section of girder, the forms are covered with oil and wax inside for easy stripping.



While Rex mixers on GMC trucks fill the forms with concrete, crews prepare to string pretensioning wire along a casting bed that has been cleared. Adjustable spreader bars hold the tops of the forms in position. The steam line to remain inside the tarps during curing has flexible couplings so that the line can be moved next to either lane.

Prestressing of 352 units for 18 Parkway extension structures goes on even during bad weather. Pretensioning strands, attached to the three-section I-beam template on the dolly, are pulled along the casting bed by a truck winch. A Rex mixer on a GMC truck chutes concrete into Food Machinery & Chemical Co. forms.





A Lima crane positions the Food Machinery & Chemical Co. steel forms along a lane being made ready for concrete. Completed girders are stockpiled temporarily along the casting bed.



Stress is applied to cable by four Rodgers 150-ton hydraulic jacks located between two steel anchor posts and the carriage-mounted template to which strands are attached. The equipment at left, made by Elgood Materials Corp., Brooklyn, controls the elongation of the jack rams and cable.

sections, was completed between December and March at the contractor's yard near the existing terminus of the Parkway in Paramus, N. J. Using a twin-alley casting bed, Reid strung out pretensioning wires along one lane while a second lane of girders was being cured. Alternating daily from one alley to another, the contractor formed one lane of girders every day. Forms stripped from a completed line of girder sections in the morning were repositioned along an adjacent lane, where pretensioning strands had already been strung out. This made it possible for the entire casting job to be handled with only one set of forms.

Dolly sets strands

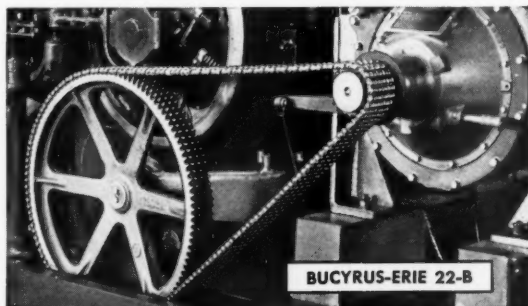
The casting bed, having a useful working length of 420 feet, consisted of a 12-inch slab 15 feet wide. Two end abutments, requiring about 350 cubic yards of concrete each, support the casting bed at either end and anchor the stationary steel uprights for each alley. Two 24-inch, 140-pound steel sections were embedded deep into the end abutments to form the uprights.

The number of $\frac{3}{8}$ -inch-diameter, 7-strand Roebling or American Steel & Wire pretensioning cables used for each casting alley was determined by the length and cross-section of the girders to be cast. Strands per girder varied from 22 to 52.

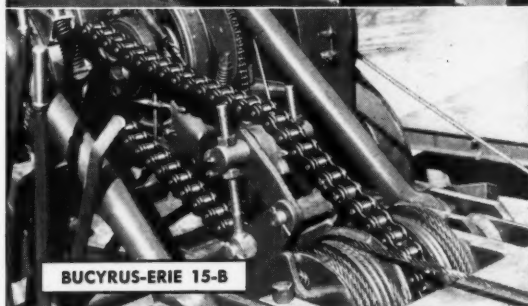
The strands were fed simultaneously to each alley from reels mounted on a stand in front of the casting bed. They were first passed through a stationary template having enough holes to accommodate any stressing pattern desired. The strands then passed through a second template mounted on the pushing carriage of the jacking system, which was located at the front of the casting bed. They then passed through the plywood bulkheads used to separate the girders of varying lengths that were to be formed in an alley.

Finally, each strand was attached by Reliable self-locking grips to three vertical steel sections that had enough holes through their flanges to accommodate any number of strands. This template, mounted on a dolly, was formed with three I-beams so that it had the rigidity re-

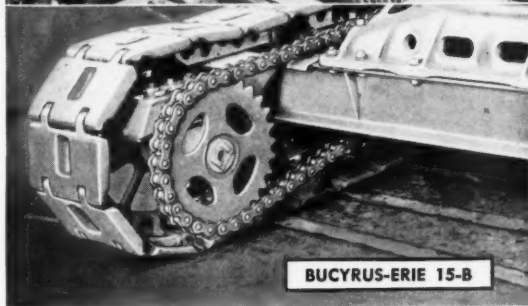
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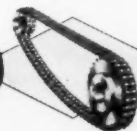
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(Continued from preceding page)

quired when strands were to be stressed.

The dolly, straddling the plywood soffit that formed the base of the concrete girder forms, was pulled the length of the casting bed, carrying the pretensioning strands from one end of the bed to the other.

During the trip along the casting bed, the dolly also supported the plywood bulkheads that already had strands passed through them. These bulkheads were positioned after the strands had been made taut. A truck winch at one end of the casting bed pulled the dolly along by means of a winch cable. The cable passed through a block and tackle attached to steel H-beams embedded in the



The mobility of a LeTourneau-Westinghouse Tournado dozer shows up to advantage as it pushes fill material into a swampy area along the right-of-way. Though rain, a high clay content in the soil, and rehandling of peat muck cut down on production, Reid Contracting averaged 22,000 yards of earth moved daily.

abutment and located at about the centerline of each alley. With this setup, the contractor was able to secure an even, straight pull along the casting bed when the initial stress was applied to the strands.

As the three-section pulling template reached the end uprights, a bar was passed through the three I-beams and attached to a Speed-Wright electric hoist. Operating on the bottom flanges of a steel beam

that was positioned above the line of end uprights, the hoist picked the three-section template off the dolly, the dolly was removed, and the template lowered into a cavity that was slightly to the rear of and equidistant to the two steel uprights. Then the three template I-beams were firmly braced.

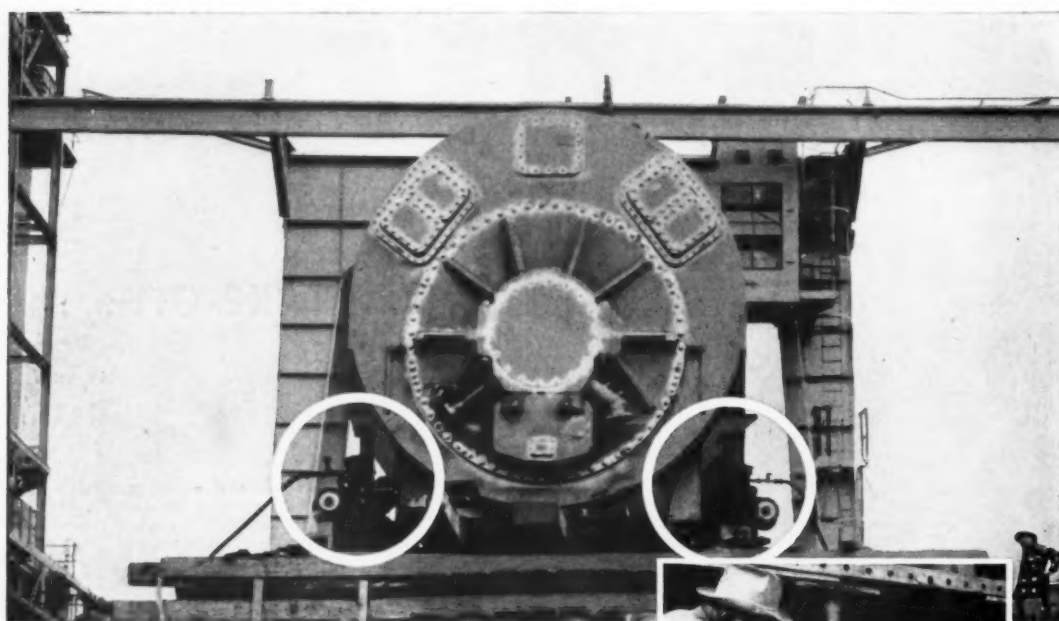
After a wide-flange steel section had been positioned across the two uprights by the hoist, it was bolted to the I-beams to complete the dead-man connection required at this end of the casting bed. The section was supported at each end by a small steel stringer between the main upright and a small column to the rear. This connection completed, the strands were cut at the other end and attached by Reliable grips to another dolly-mounted template in the next lane to be worked. An initial 1,000 pound pull was placed on each strand individually to remove the slack created as the Speed-Wright hoist picked up the template. The pull was applied to the strands by running the cable through the same block and tackle assembly used to winch the dolly along.

Steel forms

With the strands taut and the plywood bulkheads positioned and braced exactly, the contractor began placing the steel side forms with a Lima crane. Furnished in 30-foot-long sections by the Food Machinery & Chemical Co., Lakeland, Fla., a pioneer in the development of steel forms for prestressing, the forms consisted of three 10-foot sections bolted together. They had removable inserts used to shape the desired I-beam cross-section of the girders. Only one I-beam cross-section was used on this project, and it has a top flange 20 inches wide, a web 6 inches wide, and a bottom flange 24 inches wide. The height of the girders is 39 inches.

The second cross-section, used for only the interior approach span girders, was rectangular and measured 12x39 inches. I-beams were used as facial and main-span girders, thus imparting a continuity throughout a structure.

When the steel forms had been placed in position against the plywood soffit, they were locked into place with tie rods and wedges. The tops of the forms on either side were held in position by adjustable spreader bars. Before the forms were finally locked, the inside surfaces were covered with a mixture of oil and wax to simplify stripping operations.



Duff-Norton air motor screw jacks Raise Big Loads—and Profits

By ingenious use of Duff-Norton air motor screw jacks, a Dallas contractor finds that he lowers costs and speeds work. He also gets greater dependability and safety with these portable tools on difficult installations of big equipment.

Using two 100-ton capacity Duff-Norton jacks, the mechanical contractor, E. E. Farrow Company, raised a 240,000 lb. turbo-generator 22 ft. at the plant of the Western Farmers Electric Co-operative. Three men completed the job in 2½ days with a jacking-blocking procedure which resulted in a savings of \$400.

Duff-Norton air motor screw jacks were also used to raise a 210-ton 100,000-kw generator 13 ft. at the Dallas Power & Light Company, Parkdale Station. These same jacks helped cut costs of similar jobs at Haskell, Lone Star, Corpus

Christi and Riesel, Texas.

Duff-Norton air motor screw jacks have a lift of 14 to 30 inches, are mounted on rubber-tired, roller bearing wheels for easy positioning by one man, and operate on 80 to 100 lb. air pressure.

The six Duff-Norton models range in capacity from 20 to 100 tons—weigh from 238 to 530 pounds. A sturdy base prevents tipping or settling. Safe operation is assured by an automatic shut-off which stops motor when safe limit is reached. Keyway in ram prevents the head from turning and shifting load. Lowering and lifting speed is controlled by air motor. Jacks will not creep or drop the load.

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Duff-Norton Jacks

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COFFING HOIST DIVISION: Danville, Illinois

For more facts, use Request Card at page 18 and circle No. 407

After the forms and bulkheads had been placed and firmly positioned, Reid began jacking operations to place a total stress of 14,000 pounds on each strand. Four Rodgers 150-ton hydraulic jacks, two for each upright in a lane, were used to push the movable carriage carrying the strand template. In this way, all strands were stressed simultaneously. The jacks, positioned and placed by a second Speed-Wright electric hoist, were supported between the anchor posts and carriage by welded brackets.

Volumetric controls, manufactured by Elgood Materials Corp., Brooklyn, N. Y., and mounted on a panel board adjacent to the jacking area, controlled both the elongation of the rams on the four jacks and the tension being placed on the strands. The average total elongation of the strands at 14,000 pounds was 33 inches.

Once this elongation had been obtained, jacking was stopped and four mechanical screw jacks were positioned between the posts and carriage. These were turned up against the carriage until the load was transferred through them and into the posts. Then the hydraulic jacks were removed by the electric hoist and positioned in the adjacent lane for a similar operation.

Concrete poured

Concrete was delivered to the casting yard in GMC ready-mix trucks equipped with Rex mixers. Using truck chutes, the mixers discharged concrete directly to the forms, where it was consolidated by Vibro-Plus vibrators powered by Wisconsin gasoline engines.

As most of the pretensioning operations were carried on during cold months, the water and aggregates in the concrete were pre-heated so that the temperature of the mix averaged 70 degrees at the time of placement. Plastiment admixture was used to increase the workability of the concrete.

Curing girder pours

Three 3-inch-diameter steam lines, running the length of the casting bed, were used to supply steam for the curing process used. Two of the lines were located on the outside of each lane. The third line, running between the lanes, had flexible couplings so that the contractor could move it near one or the other line of girders being cured.

Four hours after a lane of girders had been poured, rubberized tarpaulins were placed over the forms to allow the concrete to obtain its initial set. Then the steam, supplied by a Cleaver-Brooks 125-hp steam generator, was turned on and its temperature raised at the rate of a degree per minute until a temperature of 140 to 150 degrees was reached. Both the 3-inch lines located under the tarps had drilled holes spaced on 3½-foot centers to allow steam to escape.

The 140 to 150-degree temperature was maintained for about twelve hours or, as the contractor had it scheduled, overnight. To prevent any

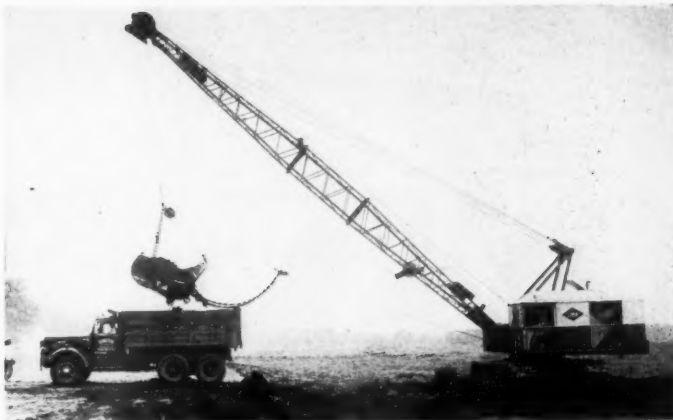
thermal shock to the concrete, the contractor did not remove the tarpaulins until the steam had been shut off for two hours.

Stripping

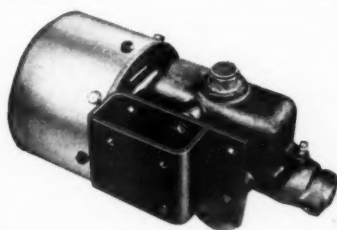
From 16 to 18 hours after a pour, and before the forms had been unbuttoned to permit strands to be detensioned, the contractor tested a test cylinder to destruction to determine whether or not the required 4,000-pound strength had been attained. If results were affirmative, the forms were loosened and the hydraulic jacks repositioned to detension the strands by a uniform releasing of the load against the carriage.

This done, the forms were stripped by a Lima crane and the strands be-

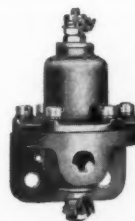
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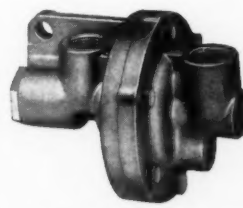
Peat muck excavation, coming to 200,000 yards on the stretch, is handled in one location by a Lima 802 crane with 3-yard dragline bucket. The Autocars haul the material to disposal areas or stockpile it as dressing for roadway side slopes.



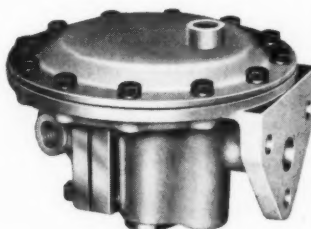
ACTUATING UNITS



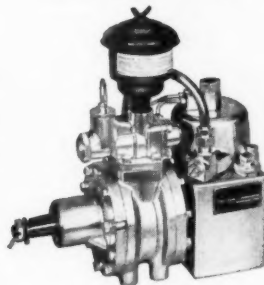
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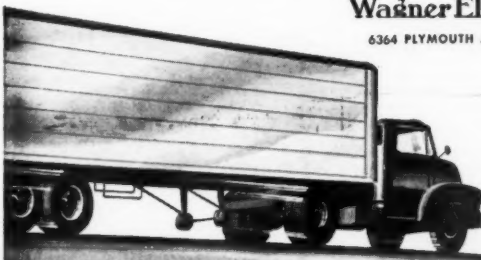
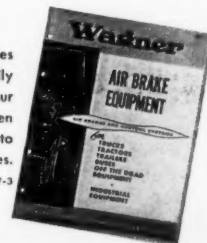
Wagner factory service branches in twenty-four major cities and air brake distributors throughout the United States and Canada service Wagner air brakes; and since Wagner air brake systems are used by a large number of fleets, mechanics everywhere are experienced in the repair of Wagner air brakes.

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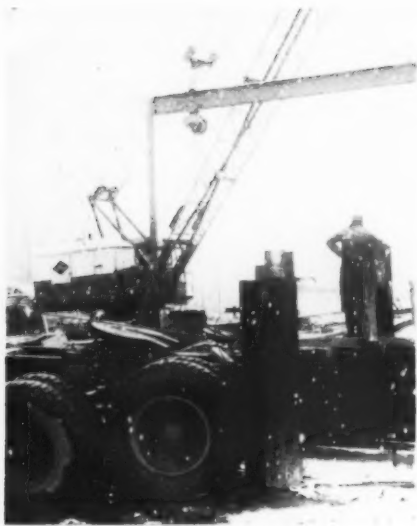
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K57-3



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For more facts, use Request Card at page 18 and circle No. 408



The truck-winch pulling the dolly has its cable run through a block-and-tackle assembly attached to a steel upright embedded at the center of the casting bed abutment. In the background, a Lima crane adjusts forms for the next lane.



* specially designed to cast huge
**PRESTRESSED
CONCRETE ROOF GIRDERS**

for American Cyanamid's new phosphate storage warehouse

Working closely with Prestressed Concrete, Inc., Florida Division's Form-Crete engineering staff supplied special mass-production steel casting side forms to produce prestressed concrete girders for supporting the roof of American Cyanamid's new triple phosphate storage plant at Brewster, Florida.

This is a typical example of the capability of our Form-Crete consultant service in supplying custom designed and fabricated steel forms to meet your requirements for specialized projects.

Important as this service is, our main objective is the supplying of skillfully designed and engineered steel poured-in place and semi-portable side forms for flat bed casting. Fabricated to order, there is a Form-Crete form for virtually every standard prestressed concrete product.

Investigate this highly profitable new market—the prestressed concrete product field with its unlimited applications...write, wire or phone today—get into the prestressed concrete business now with FORM-CRETE steel casting forms!

These girders are 101 ft.-6 in. long with a height of 12 ft. at the center tapering to 4 ft. at the ends. Top slab width is 3 ft.—weight 71 tons.



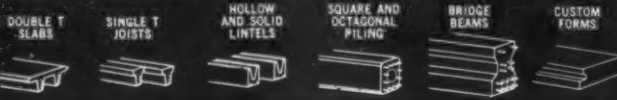
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BULLETIN 200



**FOOD MACHINERY
AND CHEMICAL CORPORATION
FLORIDA DIVISION
LAKELAND, FLORIDA**

PF-8

FORM-CRETE STEEL FORMS FOR CASTING REINFORCED OR PRESTRESSED CONCRETE



For more facts, use Request Card at page 18 and circle No. 409

(Continued from preceding page)

tween each member were cut. Then, as the forms were stripped from a lane of girder sections in the morning, they were reset, without delay, along an adjacent lane that had prestressing strands already in place. As concrete pouring operations started on the new lane, strand and bulkheads were being placed for the lane that was to be poured the following day.

The girders were stockpiled either at the casting yard or at a pick-up point near the right-of-way. The Lima crane handled all the yard lifts; two Ross Carriers transported the girders and beams to the pick-up point stockpiles. Many times, girders were loaded directly onto a low-bed trailer truck and hauled to a bridge site for erection, and in one case, a girder poured at 4 p.m. was erected at noon the following day.

Reid's efficient prestressing operations form only one part of the big 9½-mile job on the parkway extension. The road, on a 300 to 500-foot right-of-way, will consist of two 24-foot roadways, separated by a variable grassed median 10 to 150 feet wide.

Right now, Reid is building up the roadway grade by placing a 6-inch course of select material over the

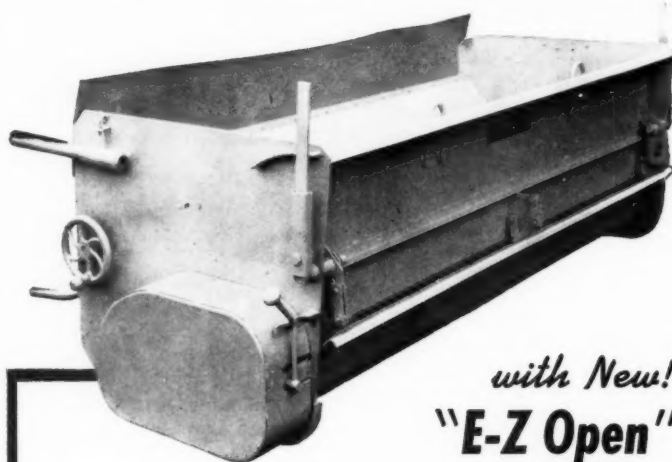
subgrade, then an 8-inch subbase of bank-run gravel, and finally, a 7½-inch macadam base in a 4 and 3½-inch lift.

Over this, a total of 45,000 tons of asphaltic concrete will be put down by two Barber-Greene pavers, one laying the 1½-inch binder course and the other, the 1-inch wearing surface.

The contractor's biggest problem—moving huge quantities of earth, rock, and peat muck in the relatively short period of ten months—is just about over. Roadway earth excavation, reaching maximum cuts and fills of 50 and 30 feet, respectively, involved moving more than 1,800,000 cubic yards of material. This takes a large and powerful earthmoving fleet, but Reid contracting had the equipment to do the job.

The 1,800,000 yards of material was moved by a total of 19 scrapers—nine LeTourneau B's, two Allis-Chalmers 200's, one Allis-Chalmers 300, three LeTourneau Model C's, two Euclid S-18's, and two Euclid 24's. Ten Caterpillar D8's and five Allis-Chalmers HD-20's were used as pull-tractors for some of the scrapers. The remaining tractors handled the push-loading job. Jobs such as clearing, spreading fills and cuts, pulling sheepfoot rollers, and maintaining the many haul

SPREAD CHIPS FASTER, EASIER!



STANDARD STEEL'S new spreader with all these features:

- Simple, low maintenance chain transmission
- "E-Z Open" gate swings away from box, carries no load
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TION DRIVEN CONSTRUCTION BROOMS . . . MAINTENANCE
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SHELVING HARDWARE . . . AND AGRICULTURAL EQUIPMENT



Standard Steel Works, Inc., NORTH KANSAS CITY, MO.

G5-157

For more facts, use Request Card at page 18 and circle No. 410

CONTRACTORS AND ENGINEERS



An Allis-Chalmers Model 200 scraper with a 20-yard capacity is one of 19 scrapers in the earthmoving fleet that moved more than 1,800,000 cubic yards of earth on the 9½ mile extension project. Push-loading here is done by an Allis-Chalmers HD-20 tractor-dozzer.

roads were handled by other tractor dozers. These included two Allis-Chalmers HD-21's, four Allis-Chalmers HD-16's, one Allis-Chalmers HD-15, a Caterpillar D9, two Cat D7's, two D6's, two International TD-24's, one International TD-9 and a LeTourneau-Westinghouse Turnadozer.

The 200,000 cubic yards of rock that had to be moved were found on three major cuts, the deepest going to 45 feet. Four Gardner-Denver Air-Tracs, powered by four Gardner-Denver 500-cfm air compressors, and two Gardner-Denver wagon drills powered by one Gardner-Denver 600-cfm air compressor, handled the drilling of the 2¼-inch-diameter holes with carbide-insert bits. The drilling and blasting for all cuts—

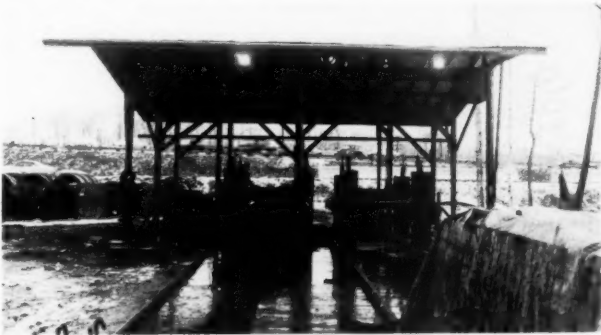
even the 45-foot deep side-hill cut was done in a single lift.

Two Bucyrus-Erie 51-B shovels loaded four Euclid end-dumps and a fleet of Mack dump trucks with the blasted rock, most of which was used in peat muck areas requiring back-fill. About 200,000 yards of this muck was removed at various locations by a Lima 802 crane with 3-yard dragline bucket and loaded to a fleet of rented Autocars. These hauled to waste areas or stockpiled the material along the right-of-way as dressing for the 1 to 2 side slopes of the roadway. With the water drained off, this material provided a good seeding soil for grassing the slopes.

Over 300,000 cubic yards of borrow material, obtained from one pit lo-

(Concluded on next page)

The concrete in the tarp-covered form is being steam cured. Behind the roofed-over jacking area for both lanes are reels of Roebling and American Steel & Wire cable used for pretensioning.



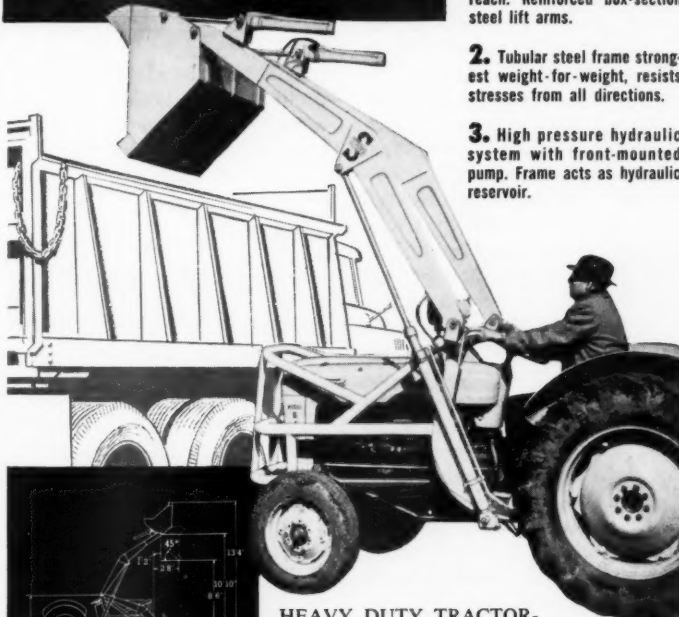
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Points of SUPERIORity

1. New higher pivot position means higher lift, greater reach. Reinforced box-section steel lift arms.

2. Tubular steel frame strongest weight-for-weight, resists stresses from all directions.

3. High pressure hydraulic system with front-mounted pump. Frame acts as hydraulic reservoir.



HEAVY DUTY TRACTOR-MOUNTED LOADERS which make light of yard materials handling. Lift to full height in 5½ sec. 10" bucket tilt-back insures heaped loads, every time. Full range of industrial buckets and crane boom attachment available.

The ½ cu. yd. capacity (2070 lb.) of the Superior Loader releases your heavier equipment for more important jobs. Superbly engineered, made of the finest materials, Superior Loaders are the answer to many yard handling problems. Write for full details—now!

SUPERIOR EQUIPMENT DIVISION

P.O. Box 341, Wheeling 6, Illinois

For more facts, use Request Card at page 18 and circle No. 412

FOUNDATION CONSTRUCTION

CAISSONS SHAFTS DRILLED AND UNDERREAMED PIERS

SPECIAL DRILLING PROBLEMS

Offices in Atlanta, Ga., Pittsburgh, Pa., Washington, D.C.

Wire or phone for a quotation on your next foundation job—ANYWHERE IN THE WORLD

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Can be Re-Used
Up to 75 times!

No more waiting 10 long days to set concrete with wet-burlap-wet-earth method. No more tying up of costly materials. Fulco does the job in 3 days flat! Does it better, too! Fulco Mats stay wetter longer and with less water. They increase the compressive strength of concrete, insulate against sudden temperature changes to produce a more uniform job. And because they can be re-used so often, they cut cost-per-job to the bone.

See your equipment dealer or contact
your nearest Fulton Branch today.



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Fultex® TRIPLE-STRENGTH TARPS



"World's
Toughest
Duck"

Also makers of
Drop Cloths
and Tents

(Continued from preceding page)

cated at the northern end of the job, was required to bring the roadway up to grade. A Euclid loader was used in the pit to load the 12 Euclid bottom-dumps with 150,000 yards of borrow required at fills along the northern half of the project, while some of the LeTourneau B scrapers worked the borrow area for the remaining 100,000 yards required at one fill at the north end of the contract.

Control elongation

Along the 9½-mile stretch, the clay content of the soil varied from one per cent to 45 per cent. The high-clay content, near the northern end of the job, required sheepfoot rolling for compaction; wobble-wheel rollers were used on the southern section where there was less clay. The high-clay content on the stretch, coupled with the excavation of peat muck—and the rehandling of peat muck during periods when rainfall made the northern section almost impassable—presented some problems for the contractor. With the equipment on hand, Reid was geared to move material at a rate of 30,000 cubic yards every 10-hour day, but with the combination of adverse job conditions, the contractor had to settle for an average of 22,000 yards moved per day during the grading phase of the work. Despite this, the earthmoving fleet has made good progress, enabling paving crews to get to work to complete the job this season.

Personnel

A. B. Reid is the project manager; Manuel Teixeira, general superintendent; and Jack Davies, assistant project manager for Reid Contracting. Each of these men keeps in constant touch with the field superintendents and office with General Electric mobile radios. Fourteen mobile sets and one base station, operating on 43.18 mcs, are in use on the project.

D. Louis Tonti is the executive director for the New Jersey Highway Authority, the agency chartered to construct and operate the Garden State Parkway. J. P. Casey is the right-of-way supervisor for the authority, and C. J. Teegen, the chief engineer.

H. A. Thomas is the project engineer, and F. N. Larkin, the resident engineer, for Fay, Spofford, & Thorndike, Inc., Boston, Mass., the consulting engineering firm supervising construction of the stretch. THE END

Clark appoints industrial relations research manager

Malcolm G. House has been appointed to the newly created position of manager of industrial relations research by the Clark Equipment Co., Buchanan, Mich. In his new position, House will analyze the 11 separate labor agreements Clark has with unions.

For the past four years, House has been a commissioner of the U. S. Mediation and Conciliation Service.

Case history

Inflatable unit stores materials at job site

The Duke Power Co., Charlotte, N. C., largest utility company south of the Mason and Dixon Line, has ordered a second Cid Air Structure for use as a general storage warehouse for utility equipment and building materials being used in constructing its steam generating plant at Pelzer, S. C.

Each of these low-cost warehouses is the standard 40×80-foot unit complete with blower and standard 4×8-foot wood frame door. Developed and manufactured by Cid Air Structures Co., the structure is made of a fabric, called Fiberthin, composed of vinyl-coated nylon and produced by the



Supported by a constant stream of low-pressure air, this Cid Air Structure provides an economical, all-weather, portable storage area.

U. S. Rubber Co.

The storage area in the units is completely unobstructed, since the structure is supported entirely by low-pressure air. Sand is used as ballast in the tube at the base which anchors the building to the ground.

According to the power company, the structures serve as ideal all-

weather storage units and are especially efficient in that they may be taken down readily and erected elsewhere without much trouble. The translucent material permits the entry of sufficient daylight for the ordinary storage-area activities. The blower maintains a constant stream of low-pressure air which supports the structure even when the swinging door is opened for fork-lift trucks.

Sizes of up to 100,000 square feet are available, and various sizes of doors and airlocks are offered.

For further information on the structures write to Cid Air Structure Co., Dept. C&E, 1501 E. 96th St., Chicago 28, Ill., or use the Request Card at page 18.

Circle No. 30.

For profitable performance go GarWood



Gar Wood-Buckeye 308 . . . the job-proved standard on grueling cross-country work. Split-shaft excavator drive provides equal power to each drive pinion . . . ends misalignment wear. Hydraulic wheel hoist permits quick adjustment for depth and grade. Simple, grouped controls offer ease of operation. Hydraulic conveyor drive is instantly controlled . . . no complicated shifting . . . never any need to leave the operator's seat!



New Gar Wood ripper is balanced to the power and weight of Euclid TC-12 tractors. Revolutionary swivel-type ripper teeth increase tractor maneuverability . . . save time on turns because they don't have to be lifted out of the ground. Easily and quickly controlled by famed Gar Wood hydraulic system. King-pin construction makes it easy to change pitch of each tooth, adjust for maximum penetration regardless of digging conditions.

Performance, the kind you can depend on regardless of job conditions, demands advanced design as well as quality construction of equipment. You get both when you go Gar Wood!

In excavators, for example, Gar Wood has developed performance features that insure maximum production. Independent chain crowd puts full engine power into every bite on shovel applications. Independent travel lets operator hoist or swing while moving. Direct gear drive and direct manual controls make for fast, accurate control on precision jobs. And just as important, Gar Wood's job-proved heavy-duty construction results in long unit-life with minimum maintenance!

If your work demands performance you can count on, take a good look at the complete line of Gar Wood truck equipment and construction machinery. Call your Gar Wood dealer, or write to: Customer Service Dept., Gar Wood Industries, Inc., Wayne, Michigan.

Gar Wood-St. Paul hoists and dump bodies . . . real performance-twins! Integral construction of lift-arms with a torque tube prevents one-sided lifting strains. This means fast, safe dumping . . . even on steep grades! Extra-rugged body construction at critical stress points eliminates spreading, warping or sagging! There's a full line of Gar Wood-St. Paul hoists and dump bodies in all capacities . . . one for your job!

GAR WOOD

PLANTS IN WAYNE AND

CONTRACTORS AND ENGINEERS



With torque-control Impactool, the crew runs $\frac{7}{8}$ -inch-high tensile bolts at a rate of 10 per minute.

Case history

Bolting crews cut assembly time in half

A 6-man riveting crew was split up into two 3-men bolting-up gangs to erect the new \$100 million Allen power plant of the Duke Power Co. near Belmont, N. C., and work was done at double the riveting rate.

With each crew equipped with an Ingersoll-Rand air-powered torque-control Model 5340T Impactool, a total of 40,000 high-tensile $\frac{7}{8}$ -inch steel bolts was run in 40 working days, hardened washers and hexagonal nuts being used. The average production of 1,000 bolts daily represented both up-in-the-air work and ground work. Where scaffolding rearrangements consumed time, about

400 bolts were run daily. In mezzanine work, where scaffolding was unnecessary, bolts could be run at the rate of 10 a minute.

Speed is made possible through the automatic torque-control feature of the Impactool, which runs the bolts to a predetermined torque and then automatically shuts itself off. The two Impactools are preset to produce a bolt tension exceeding 37,000 pounds and checked each morning for calibration to determine whether any change in bolts, nuts, or washers necessitates a change in wrench torque to produce the desired tension. They can then be run all day without the necessity for further checking. The torque setting on this job has required alteration only once a week, and the change is effected in

a few seconds on a simple jig by altering the twist in the torsion bar. Any torque setting up to 550 feet may be made.

In addition to doubling the production rate, the torque-control Impactool has eliminated all stripping of threads, and has made the work much safer than when completed with hot rivets. A further advantage is that the erectors were given the right length high-tensile bolts to use, wherever possible, in fitting up the steel. These were then left in as part of the permanent installation, thus saving time for the bolting-up crew.

The job is being handled by the Duke Power Co.'s own construction division.

For further information about the torque-control Impactool, write to Ingersoll-Rand Co., Dept. C&E, 11 Broadway, New York 4, N. Y.

Circle No. 153.

when the going gets rough...

Gar Wood 75's stand up longer... perform better! Heavy-duty conical-hook double rollers eliminate pin strain and rocking under load. Massive crawler base is built to stand up under the heaviest shocks and strains. Large-capacity drums and sheaves make for perfect spooling, longer cable life! Hydraulic coupling, capable of absorbing shock loads, is optional equipment.



INDUSTRIES, INC.

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YPSILANTI, MICH.; FINDLAY, OHIO; MATTOON, ILL.; RICHMOND, CALIF.

For more facts, use Request Card at page 18 and circle No. 414

Pa. governor liberalizes plan for condemned homes for highway construction

Governor George M. Leader of Pennsylvania has announced a new policy which will lighten the financial burden on owners whose homes have been condemned for highway construction projects. The plan provides for partial payments of up to 75 per cent of the appraisal value of a condemned home prior to final settlement.

Under the old system, property owners whose homes were taken for highway construction were not paid any amount until final settlement of their claims was made.

At the same time, the Pennsylvania Department of Highways has called upon the Army for a loan of a Bailey bridge to replace a collapsed structure at Saltsburg. The Bailey bridges were used in restoring traffic at Yardley and near Stroudsburg after Hurricane Diane in 1955. These bridges can be installed in a matter of a week or so, and are adequate to handle single lane traffic.

In the meantime, a temporary structure is being built to replace the bridge. The 147-foot bridge spans Loyalhanna Creek.

HRB bulletin analyzes expressway laws

"An Analysis of Expressway Law," Highway Research Board Special Report 26, reports on court decisions pertaining to the control of access roads and the current expressway legislation. The first part of the bulletin deals with court decisions, prior to the enactment of modern expressway legislation on access control.

The second part of the bulletin interprets the state expressway statutes and decisions. Tables show the more important substantive elements of expressway legislation, and are included to indicate the law statutes in several states.

The \$4 book may be purchased from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C.

names in the news



Richard A. Johnson, newly elected president of The Moles.

R. A. Johnson elected president of The Moles

The Moles, an association of tunneling and heavy construction engineers and executives, elected Richard A. Johnson president at the society's annual meeting in the Biltmore Hotel, New York City. Johnson succeeds Thomas J. Walsh, Jr., president of the Walsh Construction Co., New York.

Johnson, president of the Arthur A. Johnson Corp., New York, is the first "second generation" president of the Moles—his father, Arthur A. Johnson was president in 1944.

Other officers elected at the meeting are Howard A. Collins, first vice president; Mansell L. MacLean, second vice president; Richard M. Johnson, treasurer; Gilbert M. Serber, secretary; and John A. Lambert, sergeant-at-arms.

Schilling named secretary of contractor groups

The Building Contractors and Mason Builders Association of New York City, the Cement League, and the Master Carpenters Association have elected Frederick E. Schilling secretary of all three groups.

Frederick E. Schilling, secretary of the Building Contractors and Mason Builders Association of New York City, the Cement League, and the Master Carpenters Association.



tary of all three groups. The societies are affiliated with the Building Trades Employers' Association of New York City.

Schilling, a retired vice president of labor relations for the Turner Construction Co., New York City, is a consultant and a member of the board of directors for Turner. With the exception of two years' service in the air force, he has spent his entire career with Turner, directing construction of some of the firm's major projects.

Lummus elects officers

David R. Breien has been elected vice president and comptroller of the Lummus Co., New York, N. Y., engineers and constructors. At the same time M. J. Marchione and C. Frank Corbin were elected treasurer and assistant secretary, respectively.

Robert K. Lockwood, left, new assistant to the executive secretary of the American Society of Civil Engineers, and Hal W. Hunt, executive editor of the official ASCE magazine.



ASCE names assistant secretary, editor

Robert K. Lockwood has been promoted assistant to the executive secretary, William H. Wisely, of the American Society of Civil Engineers. Lockwood is succeeded in his former post as executive editor of the official magazine, *Civil Engineering*, by Hal W. Hunt.

Lockwood, a civil engineering

graduate, will be responsible for coordinating the Society's activities in the department of conditions of practice.

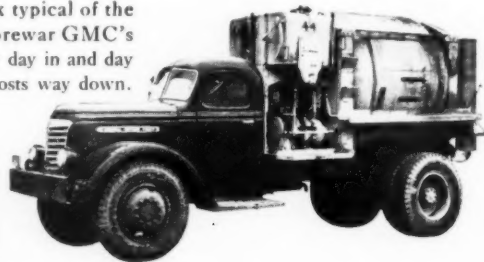
Hunt, author of many construction, business, and labor relations articles, has also a vast amount of experience in the construction field. As a project engineer for the construc-

tion plant division of the Tennessee Valley Authority, he supervised plant design for construction of major locks and dams. He was also project engineer on the design of the \$70 million naval port and airport development at Cadiz Bay, Spain.

M-C&S elects

Herman B. Block and Herbert S. Maffett have been elected vice presidents of procurement and trade relations, respectively, by Merritt-Chapman & Scott Corp., New York, N. Y., engineers and consultants. The firm also elected assistant vice presidents Edward Brause, public relations; Frank N. Oberle, Marine Salvage Division; and Harry W. Powell, construction department purchasing.

Here's a transit mix typical of the Maloney group of prewar GMC's—still making money day in and day out, while keeping costs way down.



Inside story on **THE 10-YEAR-SELLING NEW GMC's**



THESE FAST-STEPPING, V8-POWERED FW550's are some of the newest additions to Maloney's 94-GMC fleet. Other recent additions include new Turbopower Diesel models equipped for larger loads. These newest trucks are proof on wheels of Maloney's satisfaction with GMC's—used consistently in his fleet for more than 25 years.



Floyd J. Childs, left, president of the Texas Ready Mixed Concrete Association, and Allan F. Cunningham, president of the Texas Aggregates Association.

Concrete, aggregate groups elect presidents, officers

At a joint annual convention in Galveston, Texas, the Texas Ready Mixed Concrete Association and the Texas Aggregates Association elected Floyd J. Childs and Allan F. Cunningham, presidents, respectively. Childs is president of the Childs Ready Mixed Concrete Co., Abilene, and Cunningham is an official of F. M. Reeves &

Sons, Inc., Odessa.

Officers elected for the TRMCA are Dan R. Parker, first vice president; and Rai Kelso, second vice president. Elected officers of the TAA are John Van Amburgh, vice president; and Robert Pyle, secretary-treasurer. Ray L. Cain was re-elected executive secretary.

Corps of Engineers names executive, and director

Lt. Col. Seymour Rubenstein has been appointed executive for the San Francisco District of the U. S. Army Corps of Engineers. Col. Rubenstein will assist in supervising a civil works construction program for the northern California coastal region which includes flood control works, harbor development, dams, and levees. He will also be responsible for military construction at Army and Air Force bases, and military installations in Nevada and Utah.

The Corps has named Col. Alfred H. Davidson, Jr., director of the Engineer Research & Development Laboratories, Fort Belvoir, Va. Col. Davidson, now an engineer with the Eighth

Army in Korea, succeeds Col. Horace F. Sykes, who is retiring.

Lt. Col. Robert B. Kemp has been assigned to duty as area engineer of the Sondrestrom area in Greenland. Col. Kemp was formerly assistant for field operations at U. S. Army Engineer District, Eastern Ocean.

Prestressed concrete firms form new Pa. association

The Prestressed Concrete Association of Pennsylvania has been formed to further expand the use of prestressed concrete in bridge and structures in the state. The association plans extensive research and development leading to more effective uses of prestressed concrete.

Officers of the association are Howard Worthington, president; Logan Dickerson, vice president; Samuel Laucks, treasurer; Philip E. Balcomb, secretary; and Joseph Nagle, assistant secretary and treasurer.

The association, located at 208 Walnut St., Harrisburg, is composed of the Concrete Products Co. of America, Dickerson Structural Concrete Corp., Eastern Prestressed Concrete Corp. Pennsylvania Prestress, Inc., and Schuykill Products, Inc.

Intrusion-Prepakt names Roberts vice president

Harrison H. Roberts has been appointed vice president of Intrusion-Prepakt, Inc., and Prepakt Concrete Co., Cleveland, Ohio. In his new position, Roberts will deal with all phases of operations throughout the world.



Harrison H. Roberts, vice president of Intrusion-Prepakt, Inc., and Prepakt Concrete Co.

Prior to his appointment, Roberts was the firm's manager of foreign operations.

He has served as chief engineer on the Bull Shoals Dam project, Detroit Dam, Liberty Dam, and airbase construction projects in France for the U. S. Air Force. Roberts was also in charge of engineering on irrigation and flood control projects in Haiti, and most recently was chief engineer for Walsh Canadian Construction Co., a firm which held an excavation contract for the St. Lawrence Seaway Authority.

Chicago Bridge & Iron elects new officials

The Chicago Bridge & Iron Co., Chicago, Ill., has elected I. E. Boberg, as a vice president and Leo J. Marcoux as secretary.

A graduate of the University of Illinois, Boberg joined Chicago Bridge & Iron in 1924.

He is a member of the American Society of Civil Engineers, the American Welding Society, and the National Association of Corrosion engineers, among others.

OLD TRUCKS BY THE SCORE

Maloney Concrete's veteran transit mixers help explain the biggest tandem sales in all GMC history

MALONEY CONCRETE, of Washington, D. C., has experience with GMC transit mixers that dates back to the '30's.

"GMC built 'em the way we wanted 'em" is their reason. The same reason applied to later purchases that account for Maloney's present 94 GMC units.

And GMC's way of building those trucks is responsible for operation records that have the construction field talking today. For a group of Maloney's older transit mixers—some ten years old, some up to 17—have histories that show downtime—except for normal maintenance—as

a rarity. And all upkeep costs have been amazingly low.

So low, in fact, that construction haulers have been trekking hundreds of miles to study the actual records—and the veteran GMC trucks that made them. What's more, they've been going home and buying GMC tandems—at the fastest clip in all GMC history.

And remember—seven big GMC super-tandems blanket the 40,000-63,000 GVW field. In any one of them, you get the top truck—and top truckability—your money can buy. Check that at your GMC dealer's!

GMC TRUCK & COACH—A General Motors Division

For more facts, use Request Card at page 18 and circle No. 415



Johnson's batching setup at Toronto Dam site in southern Kansas works efficiently with water assured from two sources. Aggregates and sand are fed by conveyor to a shaker that eliminates dust and fines, then by another conveyor to the top of the C. S. Johnson plant, right.



Ways of getting water for concrete mix proves chief

Temporary dam, drilled well, and pipe line supply water to modern concrete batching setup

Methods of construction played a secondary part to methods of getting water for concrete mixing during work on Toronto Dam in southern Kansas.

Though finding enough water to make concrete should hardly be a problem at the site of a dam designed to control floods, the contractor had to drill a well, build a temporary dam, and lay almost a mile of pipe before he could obtain enough water to supply his plant.

This unit in a comprehensive plan for flood control and other purposes in the Arkansas River basin, under the supervision of the Tulsa District of the U. S. Army Corp of Engineers, is an earth-fill dam located about four miles southeast of Toronto, Kans. It will control the flood waters of the Verdigris River and also provide a normal conservation pool of 24,000 acre-feet. The dam is 4,200 feet long with a maximum height of 90 feet above stream bed. A 28-foot roadway will extend along the top of the dam and cross the spillway on a reinforced-concrete bridge. The spillway, located near the right abutment, consists of a 383-foot-wide, gate-controlled, concrete gravity overflow section. Seven 5-foot x 6-foot 6-inch rectangular sluices extend through the spillway to control low flow from the reservoir.

When Al Johnson Construction Co., Minneapolis, Minn., started spillway work and completion of the embankment work in April, 1956, under a \$4,762,666 contract, it first had to locate an adequate water supply, both for construction and consumption.

The possibility of obtaining water for construction in sufficient quantities from a drilled well was investigated, but after a considerable amount of study, the contractor concluded that the Verdigris River was the only suitable source.

The flow of the Verdigris, however, is practically zero at certain times during the year, and the contractor decided to build a temporary earth-fill dam across the river, approximately 300 feet downstream from the previously excavated outlet channel.

The plan was to impound water during the stages of heavy flow, using the river and the outlet channel as

Naugatuck Surfa-SEALZ



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to
last!**

DETOURS can't be avoided while new highways are being built...but there is a way that promises to *keep* those highways in *good condition, longer*, once they are opened! That is by building them with a rubber-bituminous or rubber-asphalt surface course...using Naugatuck's SURFA-SEALZ® as the synthetic rubber additive.

Year by year, test sections of "rubber roads" throughout the country continue to confirm the promise of longer life and greatly reduced maintenance! Accelerated laboratory tests add further evidence of increased adhesion to aggregate and strength of binder under a wide range of temperature and aging conditions.

Experience has shown that admixture of only 8-9% of SURFA-SEALZ makes it possible to use a *softer* asphalt surface, since the rubber retains the natural oils instead of permitting them to bleed to the surface. This greatly postpones the time when embrittlement begins to cause cracking and the need for repairs.

SURFA-SEALZ is readily available in convenient form for admixture at the job...requires no special equipment...involves no complications...adds only slightly to initial paving costs! Isn't it time *you* started making use of its advantages?



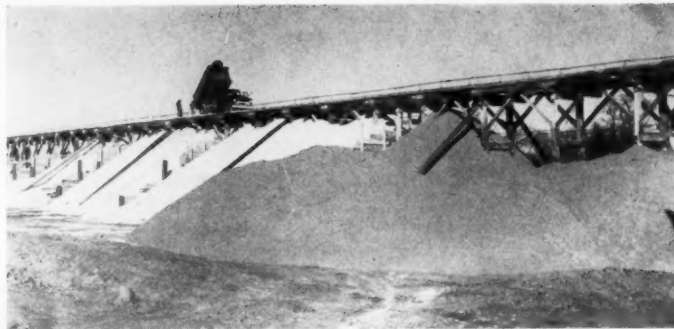
United States Rubber
Naugatuck Chemical Division
Naugatuck, Connecticut

BRANCHES: Akron • Boston • Chicago • Memphis • New York • Philadelphia • Mfg.: Naugatuck • Gastonia • Los Angeles • CANADA: Latex Div., Dominion Rubber Co., Ltd., Montreal • Cable: Rubexport, N. Y. Rubber Chemicals • Synthetic & Reclaimed Rubber • Plastics • Agricultural Chemicals • Latexes

For more facts, use Request Card at page 18 and circle No. 416

CONTRACTORS AND ENGINEERS

A dump truck unloads aggregate to a stockpile from a wooden trestle. The 10,000 tons of material above the recovery tunnel is partitioned off into sections containing sand, 6, 3, 1½ and ¾-inch stone.



Chief problem on earth-fill dam

a reservoir. This proved a more complicated job than had been anticipated, for it involved obtaining permission from the Kansas Division of Water Resources and numerous downstream property owners.

Flow stops

After permission had been granted and the dam built, the flow into this temporary reservoir practically ceased because of an extended drought condition, and in order to have a sufficient amount of water to start concrete operations, the contractor had a dragline excavate a sump in the backwaters of the dam at the river's edge. On a platform above the sump, a Layne 6-inch vertical turbine pump, with six bowls driven by a 50-hp motor, was installed. Then, 9/10 mile of 5-inch pipe was laid from the pump to the 300-gallon storage tank at the con-

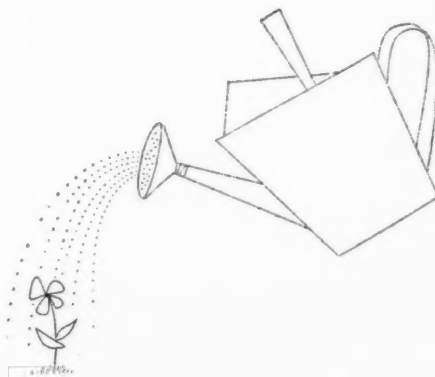
located, and when the water in the river reservoir was low, between the months of September and February, the contractor supplemented the reservoir supply by pumping water from this source into the river with a Jae-

ger portable 6-inch pump.

The pouring of the 93,000 cubic yards of concrete for the spillway, started in November, is expected to be finished—with the exception of the bridge—by early 1958. In the

early stages of the operation, a crawler crane with a 90-foot boom placed the concrete, but later, an American R20 crane with a 45-foot gantry and a 140-foot boom took over. This all-electric-operated crane

CONTRACTORS! If you want more new construction business, this advertisement will be of service to you—because . . .



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Unless you know what's going to be built, trying to get business in the new construction field is like planting seeds at random — you can't be sure what, if anything, is going to come up, where or when. Dodge Reports won't make your flowers sprout, but these timely, accurate, daily reports will help make your business grow. How? Read and mail the coupon in, and we'll tell you.

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In the 600-foot-long recovery tunnel under the stockpile, the operator opens a gate that drops sand onto the Barber-Greene conveyor. Light signals, controlled from the batch plant tower, tell the operator which aggregates to release.

crete plant and to the working and curing structure near the spillway. Even after making these extensive preparations, the contractor was not assured of an adequate water supply.

Drill well

To supplement his supply he attempted to find a source of water by drilling a well approximately one mile east of the river near the proposed access road. After going 98 feet without finding water in any appreciable quantity, Johnson abandoned the well. Then a source of water in the approach channel on the upstream side of the main dam was



Aggregates coming up from the recovery tunnel go to this Cedarapids triple-deck shaker so that dust and fines can be removed, then up the 271-foot-long Barber-Greene 24-inch conveyor belt to the top of the plant.

Supplying the 93,000 yards of concrete for the spillway is this C. S. Johnson plant, which delivers concrete to Blaw-Knox 2-yard buckets. The two larger silos have a 1,000-barrel capacity; the smaller one holds 850 barrels.



In Sandy Clay...

Contractor Compacts 18" Lift in 2 Passes!

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SOIL: Sandy Clay

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COMPACTION CONTROLLED BY: State Highway Engineers

COMPACTION SPECIFIED: 95% Modified Proctor

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NUMBER OF PASSES: 2

SPEED: 2 1/2 M.P.H.

COMPACTION COST: Approximately 2¢ per cu. yd.



VIBRATORY COMPACTION DID THE JOB!



The job described above is routine, designed to take full advantage of the "Terrapac" vibratory roller . . . The specs permitted the contractor to put down any lift he desired as long as he met the density requirements set-up by the State. The "Terrapac" CH30 enabled the contractor to put down one 18" lift, where at least two would have been required with a static roller . . . "Terrapac's" exclusive vibratory method permitted higher lifts

than is permitted when static rollers are to be used — then compacts faster, better and deeper in fewer passes . . . A "Terrapac" weighs only 3 1/2 tons yet outperforms ordinary 30-50 ton static rollers . . . Light weight permits use of small, rubber-tired tractors to keep hourly operating costs DOWN! . . . Ask your Vibro-Plus distributor for a demonstration — see what dynamic vibratory compaction can do for you on your own job!

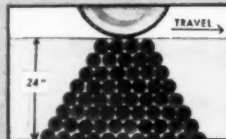


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(Continued from preceding page)

handled Blaw-Knox 4-yard buckets.

The 5-foot lifts of concrete were poured into Blaw-Knox cantilever forms with 2-inch tongue-and-groove sheathing. A heavy 40-ounce copper waterstop was placed in the vertical construction joints and between the monoliths. The contractor used one ounce of Ad-Aire air-entraining agent per sack of cement to yield 4 1/2 per cent of air in the mix. The concrete was consolidated by Ingersoll-Rand and Thor air-operated vibrators.

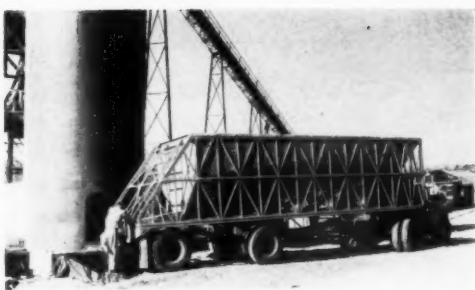
Air for the vibrators was furnished by a Joy 1700-cfm and an Ingersoll-Rand 600 Gyro-flo compressor feeding into a single receiver tank. A pipe line led from the tank into the excavation. Water for cutting the surface of the monoliths was also piped into the excavation.

Concrete plant operation

Even though the spillway requires only 93,000 cubic yards of concrete, the contractor believes that the expense of installing a completely modern concrete plant is justified. The C. S. Johnson automatic plant on the job is equipped with five aggregate compartments, with a combined capacity of 400 tons, and one cement compartment of 200-barrel capacity. The two Koehring 2-yard tilt mixers dump into an 8-yard hopper controlled by air gates. Cement is stored in three silos adjacent to the plant, one of 850-barrel capacity and two of 1000-barrel capacity. A 150-hp steam boiler furnishes live steam to the 300-gallon storage tank whenever water has to be heated for the mix.

Aggregates are carried to the bins by a Barber-Greene 271-foot-long inclined conveyor that has a 24-inch belt driven by a 50-hp motor. The recovery tunnel under the aggregate stockpile is 600 feet long and built of heavy timber on a concrete floor. A system of lighted numbers, controlled from the plant tower, signals the man in the tunnel when to open or close the manually operated gates that feed the Barber-Greene conveyor. Between the inclined conveyor and the recovery tunnel is a Cedarapids triple-deck shaker that re-

CONTRACTORS AND ENGINEERS



A Grammm 120-barrel cement trailer does a quick unloading job at the plant. Air is forced at low pressure through a specially designed fabric that lines the sloping tank, aerating the cement as it flows by gravity to the rear and out.



The International R210 truck that brings the Blaw-Knox bottom-dump buckets to the concrete placing crews has a shop-built bed. The raised platform protects workmen and allows them to hook up the buckets to the crane.

screens the aggregates to remove dust and breakage. The shaker is fed by a 73-foot inclined conveyor with a 24-inch belt powered by a 15-hp motor.

Aggregate and cement

The 10,000 tons of aggregate material above the recovery tunnel is partitioned off into five sections, containing 6-inch, 3-inch, 1½-inch and ¾-inch stone. The remaining section is for sand. The coarse aggregate is delivered by truck from a quarry about 12 miles east of the dam under a supply contract from the Weaver Construction Co., Alden, Iowa, the operator of the quarry. The sand, furnished by the Wichita Sand Co., Wichita, Kans., is delivered to Toronto by rail and then to the job site by trucks. The trucks dump their loads from a wooden trestle that runs over the top of the stockpile.

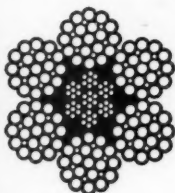
Cement for the job, furnished by the Universal Atlas Cement Co. plant at Independence, Kans., is brought by rail to Toronto where it is unloaded and stored temporarily in a Blaw-Knox 600-barrel storage plant. A Grammm 120-barrel cement trailer with a Chevrolet 10400 truck hauls the cement from the storage plant to the silos at the concrete plant. The bottom of the tank of this new model trailer is built on an incline sloping toward the rear, where the cement is discharged. As air is forced at low pressures through a specially designed fabric that lines the inside of the tank, the cement is aerated and flows by gravity on the four-degree incline of the tank.

Embankment and excavation

Nearing completion is the placing of the 850,000 cubic yards of embankment, and the excavation for the spillway, which is being handled by Buchanan Brothers Construction Co., Kansas City, Kans., under a subcontract. The placing of the riprap on the upstream face of the dam and the closure of the dam have yet to be made. The moving of the dirt from an upstream borrow pit to the dam was effectively handled by a spread of two Caterpillar DW 21's and four DW20 scrapers, push-loaded by Cat D8 and D9 tractors. The fill

(Concluded on next page)

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LOOK FOR THE YELLOW TRIANGLE

5078

For more facts, use Request Card at page 18 and circle No. 419

(Continued from preceding page)

was processed by a Rome disk harrow pulled by a Cat D7 tractor, and Gebhard sheepsfoot rollers pulled by Cat D8 tractors compacted the fill. Wet-ting of the embankment was done by two Ford trucks with 1,000-gallon tanks and one GMC truck with a 2,000-gallon tank. A Cat D8 dozer-tractor and a Cat No. 12 motor grader worked the fill.

Excavation of the 80,000 cubic

yards of rock for the spillway, also handled by the subcontractor, consisted of drilling and blasting through layers of limestone, sandstone, shale and mixed boulders. The foundation of the weir section was founded on Tonganoxie sandstone which is variable in character, ranging from a fine-grained, moderately hard sandstone to a soft micaceous, shaley sandstone. Most of the stilling basin was founded on the Tonganoxie, but shale, limestone, and

sandstone of higher stratigraphic units served as foundation rock for portions of the stilling basin.

The average depth of rock excavation was 22 feet. Two Gardner-Denver wagon drills mounted on Ford tractors and powered by a Chicago Pneumatic 600-cfm rotary compressor handled the drilling job. Two-inch holes were drilled to a maximum of two-thirds the depth of excavation and loaded with Hercules Hercomite Powder. A P&H 655

shovel loaded the rock into Euclid trucks. The waste rock was dumped along the top of the slope of the previously completed first stage embankment to a depth of approximately 12 feet, and stockpiled next



Lima Type 604 Dragline excavating trench for storm sewer pipe in Miami, Florida. This machine and the other Lima Type 604 in the background are owned and operated by R. H. Wright & Son of Fort Lauderdale and are both equipped with 45-ft. booms.

Fast-working team of LIMAS leads the way on Miami project

Work really moves along at top speed on this storm sewer job in Miami, Florida, where R. H. Wright & Son is using two LIMA Type 604's. The dragline excavates the trench while the crane follows closely behind laying the pipe—sewer jobs of all kinds are completed fast and economically when you have LIMAS on the job.

Speed, stamina and economy on the job are assured by LIMA's built-in quality extras—such as piston-ring-type dirt seals and re-

tainers in crawler rollers; flame or induction-hardened moving parts for longer life; properly balanced weight for maximum efficiency; anti-friction bearings at all important points; oversize drums and sheaves for long cable life, and long crawler mounting for greater stability.

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Lima Type 604 lowering concrete sewer pipe into position on the same project.

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Workmen trip the handle of a B-K 2-yard bucket to release concrete for the footing of the heavily reinforced training wall.

to the river bank to be used on the downstream slope of the closure section.

The neat appearance of the maintenance and storage area of the project is evidence of the superintendent's belief that good housekeeping helps to increase efficiency and reduce accidents. An excellent safety record of the job has borne out this theory. The Butler 40x100 building, which is used both as a warehouse and a shop, is equipped with radiant heating to increase the comfort and production of men in cold weather. A hot water boiler furnishes hot water to plastic tubing in the concrete floor.

Personnel

Al Johnson Construction Co. has Roger V. Evans as the project superintendent, Oscar E. Englund as project engineer, P. A. Kopp as assistant superintendent, and R. S. Charlton as office manager. The project is under the supervision of Colonel John D. Bristol, Tulsa District, Corps of Engineers. The resident engineer is F. J. Bosche; the chief of operations, Frank W. Johnson; the office engineer, J. B. Camp; and the foundation and materials engineer, Eugene Canard.

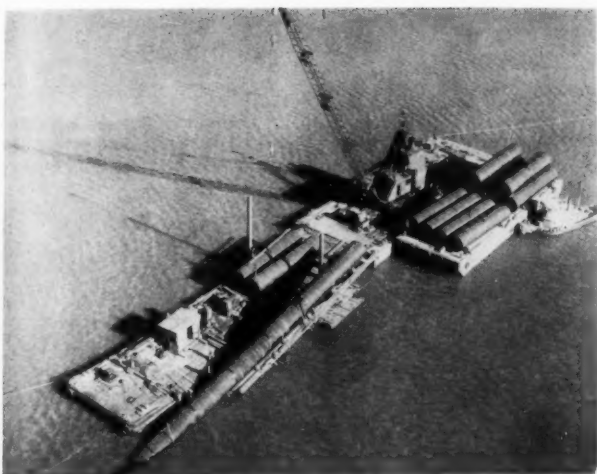
THE END

NSPE award to Read

Granville M. Read was presented with the National Society of Professional Engineers' award for 1957 at the society's annual meeting in Dallas, Texas, on June 8. Read was selected for the award for his "outstanding accomplishments in engineering, his leadership in the professional development of engineers, and his engineering contributions to the public welfare, national defense, and industrial progress."

Read is chief engineer for E. I. du Pont de Nemours, Wilmington, Del.

CONTRACTORS AND ENGINEERS



Forty-foot sections of Armco 84-inch-diameter sewer pipe are joined on the working barge, foreground, before the pipe is payed off into the bay.

Case history

Unique method of laying sewer pipe under bay

The subaqueous placing of 6,400 feet of 84-inch sewer pipe in Raritan Bay off the New Jersey coast was completed the middle of January. Enlisting the aid of the Armco Drainage & Metal Products Co., the contractor devised an economical method for assembly and placement of the pipe.

Twenty-foot sections of Armco Smooth-Flo asbestos-bonded pipe were shop matched, punched, and field-bolted into 40-foot sections on shore near the underwater site. The sections were moved by barge to the working barge, where they were bolted above water to the existing pipe.

The working barge was equipped with a sloping ramp with rollers on which the pipe could be assembled above the water and payed off into the water as additional 40-foot lengths were added. This resulted in above-water assembly of the entire length of line with only the occasional use of divers to check the final position of the pipe for alignment, grade, and condition. The pipe was suspended from the barge in an arc 200 or 300 feet long to where it touched the prepared foundation.

After completion, the entire length was tested for watertightness. Minimum acceptable loss was 650 gallons of water per hour. Test results showed loss of 315 gallons per hour.

The alternative and normal method of installation was to lay the pipe in sections anywhere from 20 to 100 feet long and connect them under water by the use of divers. This is an expensive operation, and here it was virtually impossible because of the murky water that would make the job go very slow.

For further information on Armco pipe and its uses, write to Armco Drainage & Metal Products, Inc., Dept. C&E, 703 Curtis St., Middletown, Ohio.

Circle No. 128.

Americans used 39.3 billion board feet of lumber last year—seven per cent below 1955, but two per cent above 1954 figures.



Case history: The big dozers are indispensable items in today's heavy construction picture, but there are times when a small machine is the answer to a contractor's prayer. The Joost Agricat proved just that answer when the Reading Railroad replaced twin tracks in a narrow tunnel with a single center track. There was little clearance on either side of the track for dozing the old stone ballast that had underlain the two tracks, but the Agricat with its 4-foot-wide blade did the trick nicely. Narrow shoulders which were unable to accommodate larger equipment also were leveled by the Agricat. Joost Mfg. Co., Dept. C&E, 742 Bancroft Way, Berkeley 10, Calif. **Circle No. 68.**



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FOUR TIMES FASTER

with the light-weight I-R Pin Driver

An Ingersoll-Rand PB-59 Paving Breaker equipped with a pindriving fronthead drives form pins as fast as you can set 'em! One man with a PB-59 can drive pins in from 5 to 10 seconds each—easily keeping up with the pin setter. This air-powered tool actually speeds up form-pin driving at least four-to-one.

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THE BEST AIR EQUIPMENT FOR BETTER HIGHWAYS

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Blast patterns in roadbuilding

This is the third in a series of seven feature articles, each complete in itself, on various aspects of roadbuilding. The articles were written specially for the ROAD SHOW DAILY, published by CONTRACTORS AND ENGINEERS magazine during the 1957 Road Show. They are being reprinted here, by request, for those who missed the Road Show. Each of the articles was written by a key figure in the roadbuilding industry.

"We dig 34-8 ft. holes in 3 hours with our ROPER automatic hole digger"



says M. Z. Thomas, Stow, Ohio

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CONSTRUCTION MACHINERY CO., Waterloo, Iowa

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The complexity of rock strata encountered in present-day road construction is a deciding factor in the proper selection of drilling equipment, drill patterns, and types of explosives to be used.

Commonly encountered rock formations range from shales to sandstone to limestone and finally to the granites.

Roadbuilding contractors seldom encounter two rock cuts just alike, as the stratification varies from horizontal to inclined to vertical or folded. The average thickness may be a few inches, a few feet, or a solid formation. Rock cuts not only vary from cut to cut but may completely change within a given cut.

Blasting patterns developed for a given set of conditions may give only average results as the cut progresses. Due to this state of changing conditions, the necessity of a flexible blasting pattern is obvious, as frequent adjustments in blasting procedures are necessary in order to give the desired results.

Drilling

With the advent of the large-piston-size wagon drills and the introduction of carbide insert bits, the average hole now being drilled is in the range of from 2½ to 4½ inches. This increase in hole diameter has made possible increased spacings. Coupled with the heavy-duty wagon drills has been the use of sectional steel. This allows for the drilling of deeper cuts. Whereas 12-foot cuts were an average depth a few years ago, one now finds the cuts running from 20 to 30 feet. Over-all drilling time is reduced due to less frequent moves. Blasting efficiency is increased due to better explosives.

The average spacing to burden ratio for 4-inch-diameter holes is 12 feet × 12 feet drilled 24 feet in depth. The average for 3-inch-diameter holes is 8 feet × 8 feet drilled 20 feet in depth, and for holes less than 3 inches in diameter, the average is 6 feet × 6 feet drilled 18 feet in depth.

The use of the rotary and down-hole drills in heavy shales and sandstone provides for increased spacing to burden ratios due to the 5 to 6-inch-diameter holes. Local conditions govern these ratios, which may vary from 10 feet × 10 feet to 25 feet × 25 feet. The average will be in the area of 15 feet × 15 feet drilled 30 feet in depth.

Explosives

For many years the standard grade of explosives used in road construc-

CONTRACTORS AND ENGINEERS

H. I. PHEMISTER, P. E.
Technical Service Manager,
Explosives Dept.,
American Cyanamid Co.

tion was 40 per cent ammonia dynamite. Today, this has radically changed. The majority of road construction projects are using gelatin dynamites of 60 and 40 per cent strengths or semi-gelatinous types of explosives. Some work has been done with the low-velocity blasting agents where large-diameter drill holes are being used. In general, the explosives ratio is increased when these blasting agents are used. The over-all cost may not be affected.

For blasting in shale, the average explosives ratio is .5 pound per cubic yard. As the hardness of the rock increases, the explosives ratio likewise increases, so that in shooting granite and trap rock, an explosives ratio of approximately 1 pound per cubic yard may be expected.

As the size of the bore hole has increased, so has the size of the explosive cartridge. Lengths of 12 inches to 24 inches are in common usage for holes 4 inches or less in diameter. These longer-length cartridges reduce the loading time of shots and are less likely to cause charging difficulties. For the larger-diameter holes, 5 inch by 25 pounds is a commonly used size. Where low-velocity blasting agents have been utilized they have often been poured in the hole after suitable primers had been introduced.

Much has been written on the merits of split-second or millisecond delay blasting. These short-delay caps are so constructed as to shoot in intervals measured in thousandths of a second. It has become accepted practice to utilize these caps as an aid in reducing the vibration from blasts. In addition to the vibration aspect, such advantages as improved fragmentation, throw control, and slope protection have long been proven.

In order to minimize the possibility of cutoffs or misfires from ground movement, the practice of bottom detonation is standard procedure. In addition to this safety feature, it is believed that bottom detonation pulls the bottom better, gives longer confinement of the gases, and results in improved fragmentation.

With the increase in the number of holes fired in a blast, the source of powder for the required electrical current has rapidly been changing from push-down blasting machines and electric light plants to the condenser-discharge-type blasting machine. With these machines, it is possible to detonate in excess of one thousand electric blasting caps in a single blast with a parallel circuit.

The structure of the rock formation is of major importance in the

selection of drill patterns as well as the proper hole diameter.

In hard rock, such as granite and trap rock, hole diameters of 2½ to 4 inches prevail. Hole spacings range from 5 feet×5 feet to 8 feet×8 feet. The average drilled depth is 24 feet. Subdrilling is usually about 2 feet. Drilling rigs in these formations are primarily track-type drills. A study of eight construction projects showed

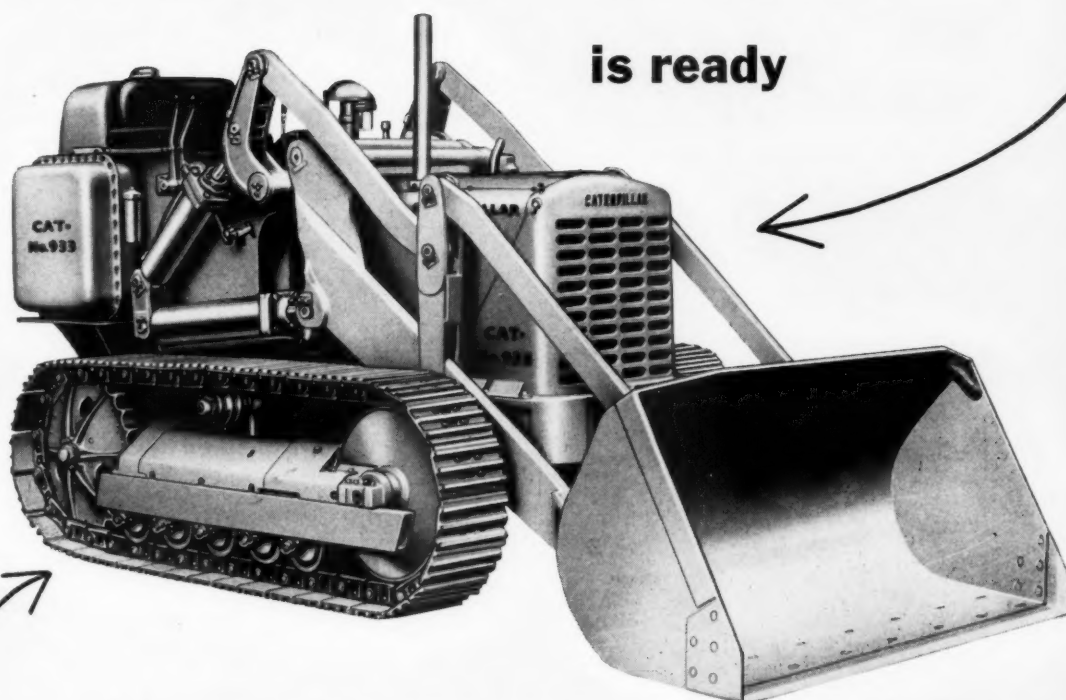
an average drilling speed of 35 feet per hour. Carbide insert bits were used exclusively. The structure of the rock was primarily of folded nature. Close spacing is usually required in order to pull a uniform bottom and to produce the desired fragmentation.

In shooting limestone, 2 to 4-inch-diameter holes are predominant. The average spacing is 8 feet×8 feet to a drilled depth of 18 feet. This in-

cludes subdrilling of from 1 to 3 feet. The average drill speed is 40 feet per hour.

The current practice in drilling in sandstone formations is about equally divided between holes 4 inches and less in diameter and holes above 4 inches in diameter. For the smaller holes, spacings average 6 feet×6 feet to a drilled depth of 24 feet. The average penetration rate is 40 feet per

ANNOUNCEMENT! The new, improved **No. 933 (Series E) TRAXCAVATOR***



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with longer life, lower maintenance!

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Now the rugged CAT* No. 933 Traxcavator includes a new heavy-duty undercarriage with:

- New Rugged Track Roller Frame
- New Solid Sprockets
- New Heavier Idlers
- New Tough Track Rollers

The complete line of Cat-built Traxcavators

	No. 977	No. 955	New No. 933 (Series E)
Flywheel HP at sea level	100	70	50
Bucket capacity, cu. yd.	2¼	1½	1
Bucket tip-back at ground level	40°	40°	40°
Bucket tip-back at maximum lift	46½°	47½°	48°
Dumping height (center of hinge pin to ground)	141½"	128"	119½"

The easy operation, the great capacity and the dependable power—these features remain as outstanding as before.

For complete details on this tough new Traxcavator, call your Caterpillar Dealer. He'll be glad to give you full information on the complete line of Cat-built Traxcavators. He's the man to remember, too, for expert service and for replacement parts you can trust.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

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**ONE GOAL: To concentrate
 our capabilities, resources and
 experience on the design,
 manufacture, distribution and service
 of job-tested heavy equipment.**

For more facts, use Request Card at page 18 and circle No. 424

hour. On the larger diameter holes, namely 4 to 6 inches, the average spacing is 12 feet×12 feet to a drilled depth of 30 feet. The average drilling speed is 35 feet per hour.

There has been a marked trend toward the larger-diameter holes on construction projects encountering shale. The use of rotary drills and vertical augers producing 6-inch-diameter holes allows for spacings from 12 feet×12 feet to 15 feet×15 feet. These drills are used on benches of from 30 to 50 feet in depth. Sub-drilling accounts for from 3 to 5 feet of hole depth. The average penetration rate is from 40 to 60 feet per hour. Where heavy-duty wagon drills are used to produce 3 and 4-inch holes, the spacings average from 10 feet×10 feet to 12 feet×12 feet.

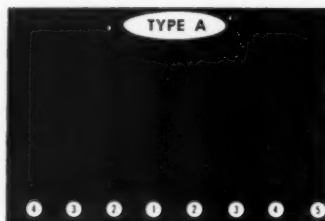
On the majority of construction projects, holes are drilled in lines parallel to the open face and in lines parallel to the center line. Very little use of the staggered system is in practice. With multiple drills in use, straight line drilling is almost a necessity.

Blasting patterns

The manner in which blasts are delayed ranges from the simple to the complex. In a recent survey of forty-eight construction projects, there were twelve different delay patterns used.

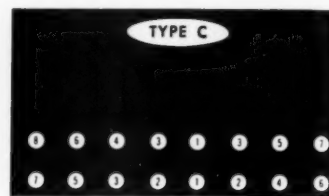
Twelve major types of blasting patterns are shown, with comments as to their application to some specific problems. In the sketches, R designates instantaneous electric blasting

caps, 1 designates 25-millisecond delay, 2 designates 50-millisecond delay, etc.

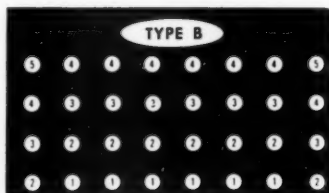


This single-row-type blasting pattern was for 4-inch holes spaced 12 feet×12 feet on a 30-foot bench. The opening delay may be placed at any point along the line. If a weak point exists in the burden, opening at that point may be advantageous.

It is usually desirable to open the shot at least two holes distant from the slope or rib line.

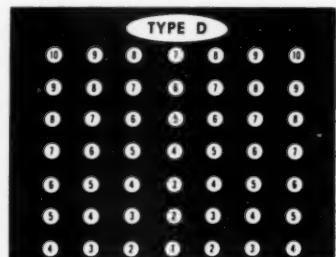


This pattern was used on a 50-foot-depth cut drilled with a 6-inch-diameter hole spaced on 15 foot×15 foot centers. The blast was near a hospital and it was desirable to introduce as many delay intervals as possible. Although not shown in the sketch, the full series of delays was utilized without complaints.

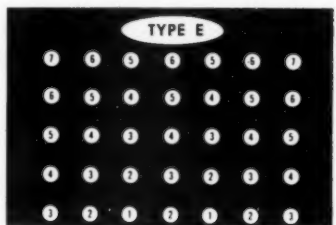


This is the most popular delay pattern currently in use. No doubt the simplicity of the delay distribution is a factor. This pattern is well adapted to end on through cut shooting. It gives good slope protection as well as back-of-shot control.

Type D, the herringbone pattern, is widely used in close shooting. The throw of the rock is towards the center of the cut. With this type of tri-

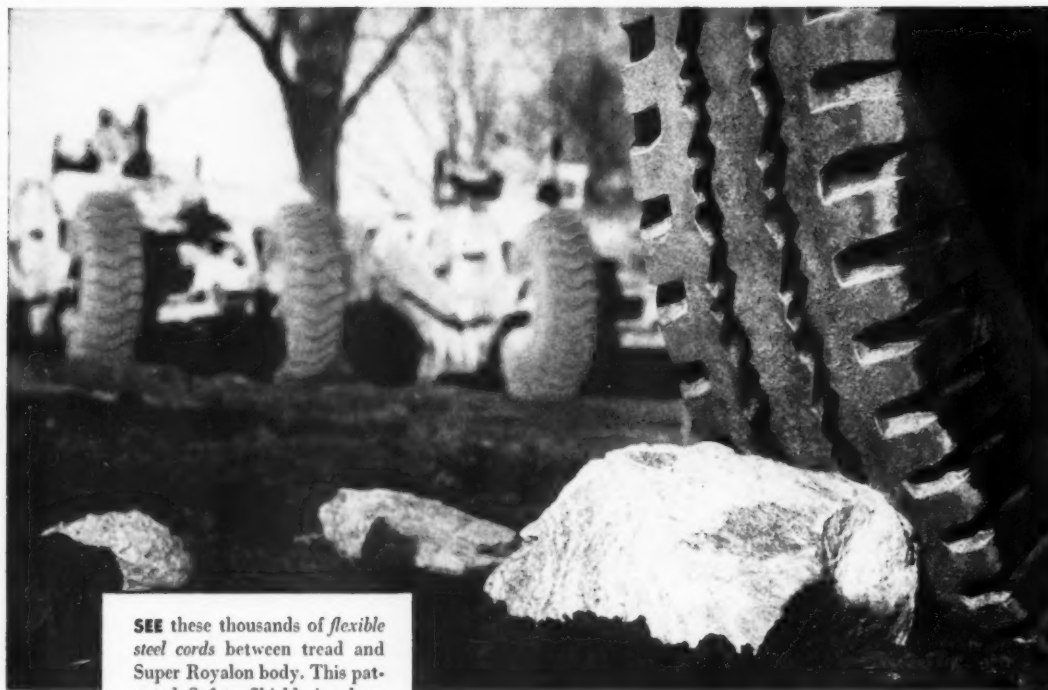


angular relief, slope lines are protected. This pattern works well in folded rock structures. Application of this pattern has been made to large-diameter holes as well as to small-diameter holes. In tough breaking rock the use of this delay distribution allows for the center opening of each successive row and in this way a definite relief is set up for the succeeding holes in each line.



This double herringbone pattern was used in a very hard sandstone which was horizontally stratified in 12-foot layers. Drilling was by a rotary drill giving a 6-inch-diameter hole. The holes were spaced on 10-foot×10-foot centers, 35 feet in

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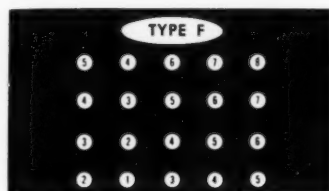
United States Rubber

Rockefeller Center, New York 20, N. Y.

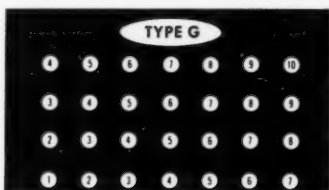
In Canada: Dominion Rubber Co., Ltd.

For more facts, use Request Card at page 18 and circle No. 425

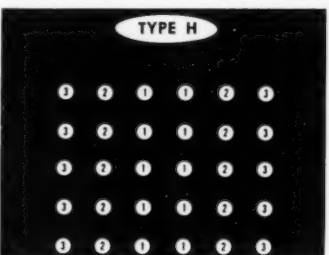
depth. Some idea of the difficulty encountered in dislodging this rock is found in the fact that it was loaded on a ratio of 2 pounds of explosives per yard of material. Ammonia gelatin, 60 per cent, was used. This is considered a complex pattern, but in the type of material that was encountered it proved to be the most satisfactory method of delay arrangement.



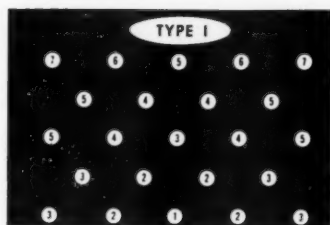
This delay pattern was used in a flagstone formation horizontally placed in 6-foot layers. Six-inch-diameter holes were drilled with a rotary drill and spaced on 12-foot x 12-foot centers. Hole depth was 28 feet, which included 6 feet of subdrilling. The shot was opened along the left ditch line, the outside of holes being slope line holes.



This delay pattern was used to remove a through cut near a house which was within 20 feet of the top of the slope and located on the right side of the cut. Holes were drilled 40 feet in depth using a 6 1/4-inch rotary drill. The drill pattern was 12 feet x 12 feet. The formation was gray sandstone in 5-foot layers. The holes were charged with 60 per cent ammonia gelatin at a ratio of 1.25 pounds per cubic yard. Fourteen feet of stemming was carried in all holes. The breakage was very good and the throw of the rock well controlled.

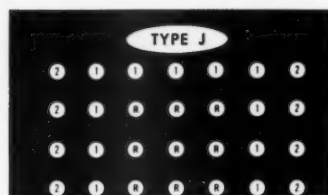


This is a commonly-used delay pattern, as it is easy to apply. The result from such a pattern is to heave the material in the center of the cut. Good slope protection is afforded from this delay sequence. On one project studied, where a boulder formation existed, this pattern was utilized where it was necessary to pull the holes in to 5x5 spacings in order to break the boulders. An improvement might be shown in this pattern by using a higher delay in the cutoff line of holes. This slight modification in the pattern should cut down on the back break.



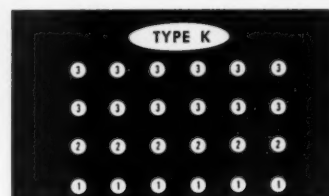
This wide-angle V-cut pattern was used in a hard-to-drill, easy-breaking standstone. Advantage of the breaking qualities was taken by the use of 15-foot x 15-foot spacings staggered. The holes were drilled to a depth of 36 feet with an auger drill using carbide tipped finger bits. The

laminated stratification was well broken with an explosives factor of only .33 pounds per cubic yard.



This type of delay pattern was used in a non-restricted area. The lower-cost instantaneous caps were used over the entire area with the exception of two delay periods for protec-

tion and one delay for the cutoff line. The holes were drilled on close spacings, namely, 5 feet x 5 feet in a stratified sandstone. An average of 14 rows of holes was shot in each blast.



This double-row delay pattern was used in a medium hard sandstone stratified in one-foot layers and in-



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Competitive operation on today's big yardage jobs calls for big dumpers that can keep tight schedules—especially when you're running a shovel that makes a 30-ton load in three or four passes. That's why so many operators are turning to Mack. For Mack gives them the toughest and most economical off-highway dumpers, as well as a large selection of competitively priced units to choose from—four basic units with a wide selection of engines, transmissions and converters... from four-wheelers with a 15-ton rated capacity to six-wheelers with a 34-ton rated capacity.

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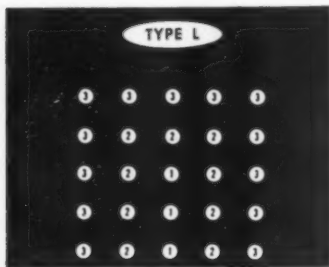
and transmissions or converters you need supplied upon gratifyingly short notice.

Why not investigate the large-capacity economy afforded by the complete line of Mack off-highway dumpers? Invite your Mack representative to give you full details and specifications. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd.

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clined at about 45 degrees. Three-inch holes were drilled on 8-foot x 8-foot spacings to an average depth of 20 feet. As many as 15 rows of holes were shot in a blast.



This U-shaped delay pattern has been used with different variations. The center row of No. 1 delays may

be expanded to two or more lines of holes. This pattern gives good slope protection as well as a clean cutoff for the succeeding blast. Dealy shoot-ing using primacord trunk lines and MS connectors utilized this pattern on one project. In effect this is a variation of Type H, and should be more effective when protection against back break must be main-tained.

General

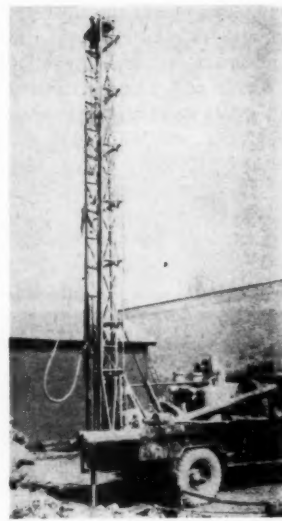
In a study of the above patterns it is clearly shown that the use of short-delay caps is well utilized to affect throw control. A second and equally important item is the protec-tion afforded the slope lines. By the use of these caps it is now possible to carry the slope lines in conjunction

with the regular excavation.

It is impossible to prescribe a set pattern to be used as a yardstick for all conditions. Trial blasts of differ-ent shooting methods should be con-ducted to arrive at some degree of standardization. There should be enough latitude in the selected pat-tern to allow for adjustment in over-coming local changed conditions. The conditions peculiar to the area being blasted will always determine the cor-rect pattern.

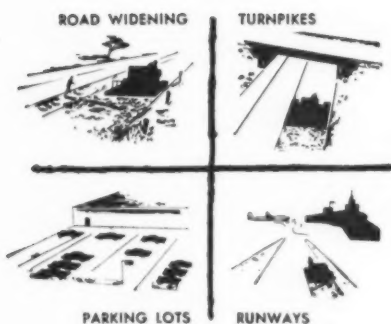
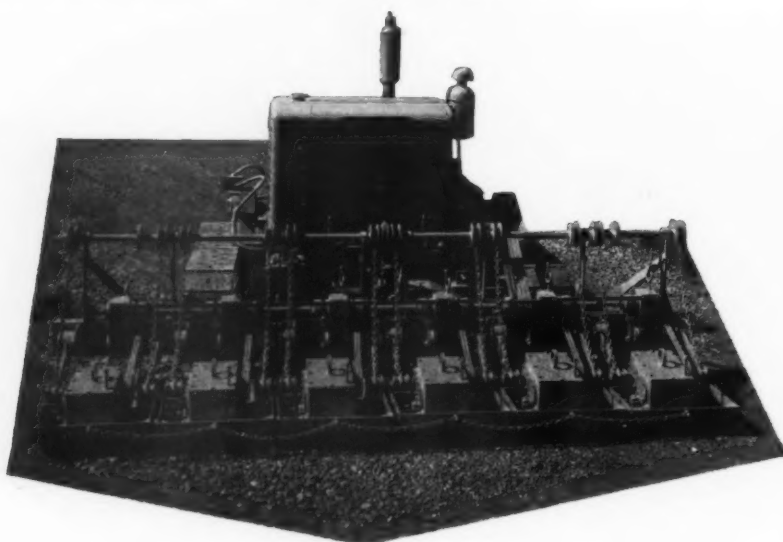
In using the series in parallel con-nection for hooking up caps, it is good practice to run the series par-allel to the center line of the cut. In this manner (should a series misfire) the trouble will be localized in one area and not tie up the excavation procedure.

THE END



The Davey M-8A rotary drill on a Hoffman Bros. Drilling Co. job in Punxsutawney, Pa.

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...one lift sub-base and base course compaction to 95% and better modified Proctor oftentimes in one pass. Vibro-Tamper gives you this at speeds that enable V-T compaction to keep up with your spreader.

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Case history

Rotary drill doubles as crane, pile driver

An unusual construction job on which a Davey M-8A rotary drill is functioning alternately as a drill, a crane, and a pile driver is being com-pleted by Hoffman Bros. Drilling Co. in Punxsutawney, Pa.

In addition to drilling 6-inch build-ing support holes, the M-8A lifts pil-ing into position and then drives it into place. The latter operation uti-lizes a large circular weight welded to the upper end of a 15-foot length of 3-inch pipe. This is lifted by the draw-works of the drill above the center of the piling, and then re-leased. The resultant impact, when repeated, supplies sufficient force to firmly seat the piling.

The M-8A is also said to be adapt-able to core drilling, structure test-ing, and shot and blast holes. The unit, which uses both compressed air and high-pressure water for drilling, has a rated capacity of 6 1/4-inch holes up to 300 feet with air and 1,000 feet with mud. It is designed for pulling 15-foot drill section stems.

For further information on the Davey M-8A rotary drill, write to the Davey Compressor Co., Dept. C&E, North Water St., Kent, Ohio.

Circle No. 83.

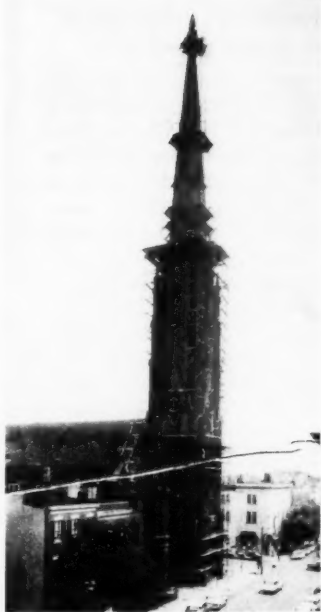
Specialty firm opens doors for business

The former general sales manager of the Keystone Asphalt Products Di-division of American-Marietta Co., James E. Poole, is now heading his own business as a manufacturer's rep-resentative.

The new venture, Jim Poole Con-struction Specialties, has its sales of-ice located at 1106 N. Princeton Ave., Arlington Heights, Ill. At present, Poole is representing a group of spe-cialized accounts, including Serviced Products Corp., Chicago, on its line of construction materials, and the Ruberoid Co. on rock shield for the pipeline industry.

Poole has had 17 years' experience in the construction and pipeline fields.

CONTRACTORS AND ENGINEERS



A total of 1,200 frames of Waco scaffolding enclose this church tower in Baltimore.

Case history

Versatile scaffolding facilitates tower repair

Some unusual scaffolding problems were faced recently by the Consolidated Engineering Co. of Baltimore.

Its job was to erect tubular steel scaffolding for use in painting, cleaning, pointing, and replacing building materials at Baltimore's First Presbyterian Church. Not only had the nearly 100-year-old building never been scaffolded before, but from a structural standpoint the steeple itself was unique. One of the tallest in that part of the country, it rises 227 feet from a base 26 feet square, tapering to a pinnacle at the top.

Edward Scott Hopkins, a Baltimore consulting engineer, supervised the laying out of the job, and 1,200 frames of Waco tubular steel scaffolding were supplied.

The design of the church necessitated running part of the scaffolding up from the ground, and part down from the roof. All of the scaffolding had to be offset to follow the contour of the tapering steeple.

The age of the building and the height of its steeple made the safety of the workmen a prime consideration. Used as it was, Waco scaffolding played an important part in promoting that safety. At the same time, the ease and speed with which the scaffolding could be set up and dismantled meant considerable savings in time and in labor costs. Both the contractor and members of the church's financial committee were well satisfied with the over-all cost of the work.

For further information on Waco scaffolding and its uses write to the Waco Mfg. Co., Dept. C&E, 3565 Wooddale Ave., Minneapolis 16, Minn.

Circle No. 138.

A \$75 million bond issue has been approved in Washington and provides that the bonds be paid from motor fuel tax receipts, but shall not be general obligations of the state.

JUNE, 1957

Case history: William Bros. Co., Tulsa, Okla., pipeline contractor, solved the problem of providing field offices and housing for crews on pumping station projects in Turkey by purchasing 51 Spartan mobile units and shipping them to the site. Here, part of the shipment is being loaded at New Orleans. The aluminum fabricated mobile units are of all-riveted aircraft-type construction, ride on tandem axles, and have brakes at each wheel. Units of 28, 35, 40, 45, and 50-foot lengths are available. Spartan Aircraft Co., Mobile Home Division, Dept. C&E, 1919 N. Sheridan Road, Tulsa, Okla. Circle No. 70.



"EXTREMELY SATISFIED" say Graves Brothers of their LIPPMANN "CHIPPEWA" Portable Secondary Crushing Plant



Graves Brothers plant at Blevins, Ark. turning out 1100-1200 yards of specified material per day.

More and more sand and gravel producers as well as contractors are buying portable plants so as to work near-the-job pits, cut trucking and transport costs. Those, like Graves Brothers, who choose Lippmann portable plants get the kind of output that makes profits and the kind of product quality that keeps their customers happy.

Whether your needs in the portable line call for complete dual crushing plants, primary, secondary, screening or washing, or combinations of these — there's a proven Lippmann-engineered arrangement to meet your requirements.

Features of Lippmann portable plants are stability and mobility — the balance between components that requires no blocking or jacking — for quick and easy set-up. Owners also cite the exceptional performance of individual components such as Grizzly King and Rock Ram jaw crushers, superior Roll Crusher secondaries, Screen-All screens and Ever-Seal conveyor idlers that never need greasing.

Want more data on Lippmann-engineering for your requirements, either portable or stationary? Contact your Lippmann Distributor, or write direct. Lippmann Engineering Works, Inc., 4637 W. Mitchell St., Milwaukee 14, Wis.

1620-57-4

July 28, 1956

Lippmann Engineering Works, Inc.
Milwaukee, Wisconsin

Gentlemen:

Our Lippmann secondary crushing plant is turning out from 1,100 to 1,200 yards of GB-3 material a day here in our pit in Blevins, Arkansas, with about 15% being crushed through your 30 x 26 roll crusher on the plant. The size rock going through runs up to 3" to 3½", which in our opinion, in this size roll, is very good crushing.

The whole unit is turning out this kind of performance making us extremely satisfied with the operation.

Yours very truly,
GRAVES BROTHERS,
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Signed: W. L. Graves

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Lippmann also makes the "Mohawk" Primary and "Comanche" Dual Portable Crushing Plants. Write for bulletins 1610 and 1600 respectively.

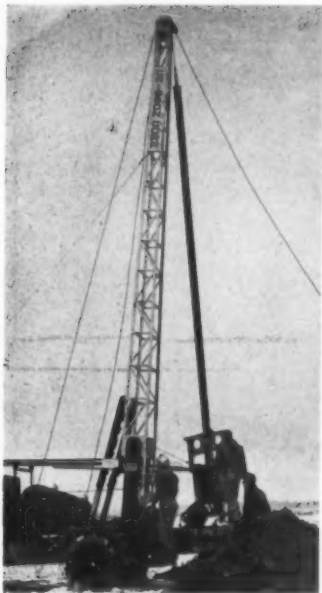


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For more facts, use Request Card at page 18 and circle No. 428



Excavated dirt spews rapidly from the digging bucket of this Calweld machine on one of Caisson Corporation's jobs.

Case history

Drilled-In-Place Caissons Cut Foundation Costs

When Commonwealth Edison Co. of Chicago recently needed a new powerhouse finished in five months, its designers specified drilled-in-place piles, and called on Caisson Corp., Skokie, Ill., to do the job. It was a tricky assignment; the public utility wanted the ultimate in speed, and yet working room was at such a premium that only one drill rig could be assigned during the week when



A feature of the drilled-in-place method, in addition to its cost-cutting characteristics, is the fact that each unit can be completed promptly. Here concrete is being placed to complete a unit even before the drill rig moves off location.

other foundation operations and excavation were under way.

Caisson Corporation's management solved that one by bringing in everything it owned—five Calweld rotary drill rigs at that time—on Saturday and Sunday.

The machines worked day and night on weekends. Commonwealth's engineers estimated that spread footings would have cost three times as much, and would have taken months to complete. The drilled-in-place caissons, by comparison, were started September 12 and finished October 4. When the rigs had moved off, there was little excavated material to haul away, no backfill to place, and no

bills to pay for unwatering the construction area. The building was finished well within the specified five months maximum period.

For another example by the same contractor, Caterpillar Tractor Co. has under construction a new 20-acre warehouse, under one roof, near Morton, Ill. The site is about eight miles from its Peoria headquarters. Caisson Corporation's Calweld earth boring machines made short work of that 872-unit assignment, completing 671 caissons in only 14 working days. And it was done in late fall and early winter after snow had fallen and drilling conditions were difficult.

Caisson Corporation has even built its own special stubby derrick for one of its machines for use under bridges and other such areas where the headroom is limited. On a recent building for Cardwell-Westinghouse in Chicago, the work area was too congested for pile driving, and spread footings would have taken far too long and presented a serious ground unwatering problem. Drilled caissons proved a cost-cutting, time-saving answer.

For further information on these rotary drill rigs write to Calweld, Inc., Dept. C&E, 7222 E. Slauson Ave., Los Angeles, Calif.

Circle No. 32.

Concrete pouring starts for power plant dam

Concrete pouring is underway at the Priest Rapids Dam on the Columbia River in Washington. The \$166 million hydroelectric power project will take about 910,000 cubic yards of concrete in its central section. The dam is being built by the Public Utility District of Grant County as the first phase of a new Columbia River development.

The dam and powerhouse are being constructed under a \$91,880,625 contract by Merritt-Chapman & Scott Corp., New York, N. Y. The powerhouse will be equipped with eight



CLAMSHELLING ACCESS SHAFTS in tight quarters is just one of a variety of tough jobs tackled by three American Truck Cranes for Dravo Corporation. The Pittsburgh, Pa.,

firm is handling all work on a 10 mile section of the multi-million dollar project now under construction for the Allegheny County Sanitary Authority.

5 AMERICAN CRANES DRIVE PILES, EXCAVATE ON 80 MILLION DOLLAR SEWER PROJECT

Two of the country's leading contractors are currently building an 80 million dollar sanitary sewer system in Pennsylvania. It's a 60-mile system of tunnels, access and diversion stations that will tie-in with existing facilities to serve Pittsburgh and 68 adjoining communities. Five American Truck Cranes work for the contractors on this project slated for completion in September, 1958!

Ten miles of tunnels up to 14 feet in diameter will be drilled and blasted through continuous rock by Dravo Corporation. Fifty-seven diversion structures, averaging 20 feet deep are required. Three American 300 Series Truck Cranes are used by this contractor to

drive sheet piling for cofferdams and perform general excavation and concrete construction.

B. Perini & Sons, Walsh, Morrison and Kaiser are performing similar operations on a six mile portion of the extensive system. Tunnels 12 feet in diameter range in depth from 30 to 96 feet deep. Perini employs two American 300 Series Truck Cranes for pile driving and excavating access shafts—one 80 feet deep!

With a crane front quickly adaptable for clamshell, dragline or pile driving, or with shovel or backhoe fronts, American Cranes perform multiple jobs over wide areas of this sprawling project. Capacities of this versatile line begin at 1½-yard, 12½ and 15 tons!

CONTRACTORS AND ENGINEERS

generators with a total capacity of 630,000 kilowatts.

HRB text treats concrete aggregate durability

"Freeze-Thaw Durability of Aggregate in Concrete", Bulletin 143, contains two papers presented at the 35th annual meeting of the Highway Research Board. The first paper describes the testing procedures used in the Michigan State Highway Department to determine the acceptability of aggregates for concrete highway work. The paper also covers laboratory freeze-thaw results and field observations as a first step in

formulation of a policy on the acceptance of future aggregates of unknown service behavior.

The second paper describes the effect of heavy media separation on concrete made with Indiana gravels. Laboratory data on freeze-thaw durability are correlated with field observations to indicate what effect the addition of crushed stone and heavy media separation have on the durability of concrete made with gravel coarse aggregate.

Copies of the bulletin, priced at 60 cents each, may be purchased from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C.



An International TD-18 with Drott Skid-Shovel loads out a 3-cubic-yard dipperful of rocks and dirt on a Washington, D. C., excavation job.

Case history

Front-end loaders speed excavation job

John McShain, Inc., Arlington, Va., contractor, has been making rapid progress on the basement excavation for the new State Department building to be constructed in Washington—thanks in part to three front-end loaders.

The Arlington firm, prime contractor on the \$59.4 million project, is using three Drott Skid-Shovels to handle the entire earthmoving job on the project. An International TD-18 with Skid-Shovel, equipped with a 3-cubic-yard bucket, and a pair of International TD-14's with Skid-Shovels load out the 120,000 cubic yards of material to be moved to make way for the basement of the first of three planned units.

The Skid-Shovels will also be used to remove 3,200 cubic yards of concrete, plus trees and debris, as part of the task to provide space for the new building.

The space for the first structure, to cover a 149,500-square-foot area, is being sunk 30 feet to accommodate a basement.

The TD-18-mounted Skid-Shovel has loaded out 600 cubic yards of soft rock every 6 hours, despite a 4½-mile truck haul cycle. The entire fleet of units has produced 1,300 to 1,400 cubic yards during the same period.

For further information on the Skid-Shovel, write to the Drott Mfg. Corp., Dept. C&E, 3126 S. 27th St., Milwaukee 15, Wis.

Circle No. 92.

Book reports on history of Wiley publishing firm

"The First One Hundred and Fifty Years" contains the history of John Wiley & Sons, Inc., New York City publishers of scientific and engineering texts.

The book explains how the publishing firm switched from printing fiction and non-fiction books to technical publications. Some of the topics developed are books on geology, geometry, engineering mechanics and strength of materials, and aeronautics. All phases of engineering books are reviewed.

Priced at \$7.50, the book is available from John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y.



MAKING GROUND, one of B. Perini & Son's two American 300 Series Truck Cranes begins work on access shaft. Sheet piling will be driven next, excavation continued to depth. When jobs are up to 100 feet of boom, 30 feet of jib, and reaches with capacity loads operators prefer outstanding stability of American Truck Cranes.

JUSTABLE PITCH BUCKET gives American 200 Backhoes maximum digging efficiency at every within their range. A ¾-yard, 22½ ton capacity machine, the efficient 200 Series is offered as a crawler or truck crane. Get complete facts on this amazing machine that costs less initially, less in the years yet maintains consistently high production rates. See your nearby American Distributor for full information!



SEVENTY-FIVE YEARS of continuous product development highlights this year's Diamond Anniversary at American Hoist! Countless man-hours of engineering have, in these many years, gone into the development of American products. The design and production engineers at American Hoist draw from this tremendous backlog of experience in basic crane development. You benefit with machines that increase production capacities and efficiency while reducing operating and maintenance costs.



SWINGING LEAD, HAMMER AND PILING into working position is another Dravo Corporation owned American Truck Crane. Used extensively in this contractor's construction of diversion stations, the American cranes demonstrate their versatility by handling pile driving jobs along with excavation duties. A 25-ton capacity machine, job proved for consistent, trouble-free performance, the American is a highly mobile, fast working machine! Owners across the country, working with backhoe, dragline, shovel and crane fronts report consistently lower operating and maintenance cost. Your nearest American Distributor will give you complete specifications for this machine available as a crawler or truck crane. See him for a complete crane line!

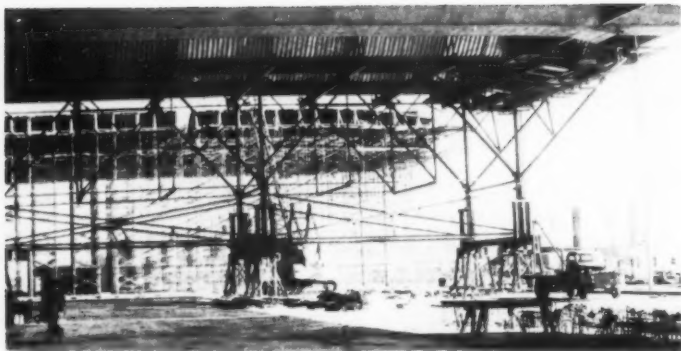
AMERICAN HOIST and Derrick Company

St. Paul 1, Minnesota

For more facts, use Request Card at page 18 and circle No. 429



Firm improves methods of building unique hangar with cable-suspended roof



One of two traveling steel falsework bents, used to support the roofs on either side of the central section during casting and curing stages, forms a 60-foot-wide section of folded plate roof. The Mahon steel decking carried by the bent is supported on a structural steel frame.

Any type of construction that is the first of its kind always brings with it problems never before encountered. The giant hangar or airframe overhaul structure for the Trans-World Airlines overhaul base at the Mid-continent International Airport, Kansas City, Mo., was one of these jobs. The contractor's biggest problem was handling and curing the large volume of lightweight concrete required for the roof. With no precedent to go by, the contractor changed methods whenever experience with the work showed a better way of getting the job done.

The 818x431.5-foot hangar (816x420 inside) has a 100-foot-wide central structure with 150-foot-wide

cable suspended, folded plate concrete roofs extending out to both sides. These three units, together with the doors along both sides, give the structure a total width of 420 feet. Both ends of the hangar are enclosed, but the two 818-foot-long sides are fitted with rolling doors.

Under the cantilever roofs on each side is an area 160 feet wide, 44 feet high, and 816 feet long. Unobstructed by columns, the area is big enough for nine Constellations and four Martin-type planes. The overhaul of between 155 and 175 planes can be done at the facility.

Cables support roofs

The central section consists of a

SMOOTHER HIGHWAYS
are being built **FASTER** . . .
at **LOWER COST** . . . the
modern **SLIP-FORM** way

THE QUAD-CITY PLANNER

with 11 foot
(straight edge)
crawler tracks



This 8200 lb. completely adjustable sub-grade planner, on 11 ft. crawler tracks, is towed behind the mixer or ahead on sub-grade. Crawlers travel on 14" control strips prepared by form grader. Quad City 24' self-propelled track adaptors can be furnished to carry a stock, power fine grader at 3 to 6 ft. per minute.



THE QUAD CITY SLIP-FORM PAVER

The 32,000 lb. Quad City Slip-Form Paver, travels at speeds of 4, 6, or 8 ft. per/min.

The Paver strikes off, compacts by vibration, tamps, meters, extrudes, finishes, belts, and confines the edges to proper width and alignment, at the same time controlling the finished surface to specified tolerances and producing proper thickness. One State reports a possible \$8,000 dollar per mile saving on 12 inch slab by the use of this machine, with a top production of 1934 lin. ft. Top production on 6 in. slab has reached approx. 3700 lin. ft. per day, mixing being the controlling factor.



QUAD-CITY EQUIPMENT CO.
ROCK ISLAND, ILLINOIS

For more facts, use Request Card at page 18 and circle No. 450



Above: Pouring section of first floor of new 5-story Herman Miller Bldg., Dayton, Ohio. Right: Close-up of operator using a Master "1-Man" vibrator between closely spaced reinforcing rods.

"1-Man" vibrators cut cost on \$4,000,000 office building

"Our two '1-Man' vibrators are the best pieces of equipment on the whole job," says Zimmer Miller, Supt., Miami Valley Construction Co. "We use them exclusively to vibrate the 7,000 yds. of concrete going into footers, columns, walls and slabs on this job. We cover 6,950 sq. ft. with each slab pour and *one man* with a Master vibrator keeps up easily with the pour and thoroughly vibrates the heavily reinforced pan slab.

"We like these vibrators because we know they can take it and because they save us money every day on the job."

You'll like the new "1-Man," too, because it gives you 100% longer life than other makes. The motor is sealed in the vibrating head; there's no flexible shaft to get out of whack; no oiling or greasing problems. It's actually a self contained, precision built vibrator. It weighs only 25 lbs. . . and with no heavy engine or motor to drag around, one man handles it easily. Plugs into any regular 115 volt AC or DC outlet. Find out yourself . . . write for free folder or ask your Master distributor for a free demonstration.

MASTER VIBRATOR COMPANY
151 Stanley Ave., Dayton 1, Ohio

MASTER

For more facts, use Request Card at page 18 and circle No. 431

CONTRACTORS AND ENGINEERS



More speed is given to roof forming when two additional sets of forms, 60x150 feet, are supported on scaffolding. The 40-foot-high Beaver-Advance scaffolding is set up opposite the end where falsework bents are in use.

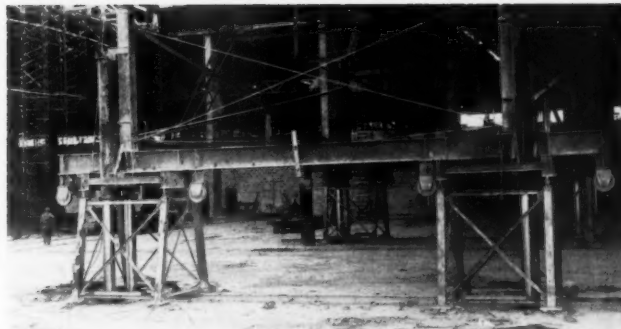
series of high bents, and the cantilever roofs are suspended from these by cables. Each bent consists of two tall rectangular columns, spaced 100 feet apart, with a 30-foot deep anchor wall connecting them at the top. The bottoms of the anchor walls are at the level of the cantilever roof, about 44 feet above the ground floor.

The 28 bents, spaced 30 feet apart, form the backbone of the structure. Heavy cables anchored at the tops of the walls run 132 feet out to the anchorage points of the roofs. Other cables in these same anchorages extend through the walls to absorb the tension in the tops of the walls. The

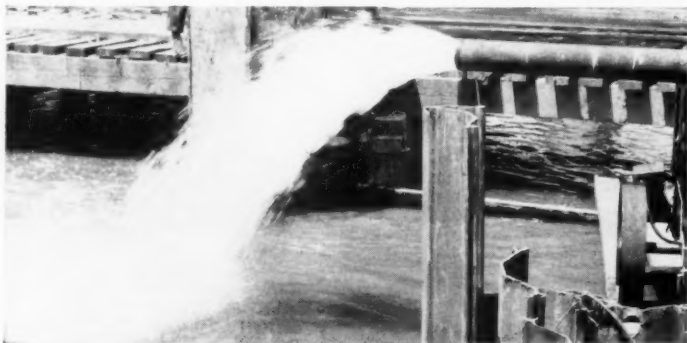
(Continued on next page)

Columns of reinforcing steel give a skeletonized form to the 100-foot-wide center section of the building. Reinforcing reaches a height of 74 feet, the height of the anchor walls.

(Additional photo on front cover.)



When the falsework is ready to be moved, it will be lowered by Rotary Lift jacks that have 8 feet of travel. The large adjustment is necessary so that the form can clear the corrugations of the roof. The bent moves on wheels riding three rails laid on the floor of the hangar.



Quick way to measure 90,000 gallons

Given a tight suction line and 10 ft. static lift, a 90M Rating Plate on a new pump guarantees that you can pump at least 90,000 gph (1500 gpm) against a 25 ft. head. Capacity at higher lifts and heads is certified by the same standards.

For pumps from as small as 4000 gph to as large as 125,000 gph, AGC standards and Rating Plates give you this needed information and guarantee its correctness. In addition, AGC standards guarantee ample engine power and up-to-date design to assure you of satisfactory service from any rated pump.



To maintain these helpful standards, demand the AGC Rating Plate on any pump you buy.

Demand this Rating Plate for your protection.

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THE JAEGER MACHINE CO.
Columbus, Ohio

JACUZZI BROS., INC.
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MARLOW PUMPS
Div. of Bell & Gossett Co.
Midland Park, N. J.

McGOWAN PUMP DIVISION
Leyman Mfg. Co., Cincinnati 2, Ohio

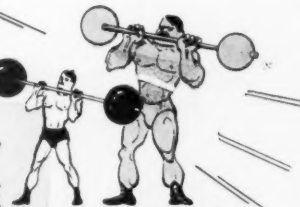
RICE PUMP & MACH. CO.
Belgium, Wisc.

STERLING MACHY. CO.
Los Angeles, Calif.

WORTHINGTON CORPORATION, Contractor's Pump Division, Plainfield, N. J.

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POWER PERFORMANCE



Introducing
the NEW

in a light weight, man-size

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Air-Cooled

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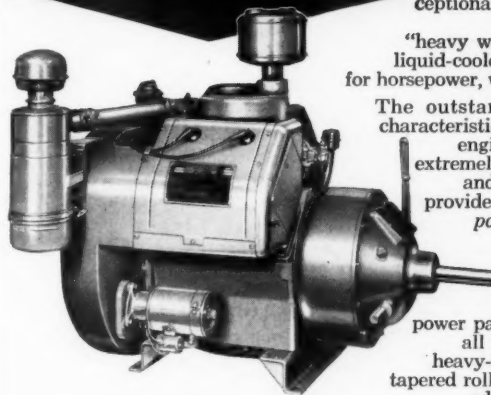
56 H.P.
Model VR4D

• Climaxing years of engineering development, this great new engine offers manufacturers and users of power equipment all the advantages of AIR-COOLING, at temperatures from low sub-zero to 140° F., in an exceptionally rugged engine that

measures up to any "heavy weight" industrial type liquid-cooled engine, horsepower for horsepower, with many plus values.

The outstanding High Torque characteristic of the Model VR4D engine, combined with its extremely rugged construction and heavy-duty stamina, provide load-lugging holding power, long life and top power performance.

Advanced "V" design provides an extremely compact power package which includes all traditional Wisconsin heavy-duty features such as tapered roller main bearings plus additional new features.



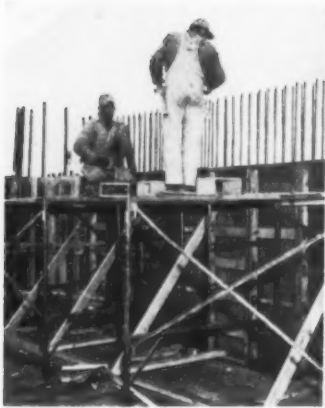
Model VR4D Open Engine with heavy-duty clutch, rotating screen, electrical equipment and pre-cleaner.

This new engine rounds out a complete line, comprising 15 models in 4-cycle single cylinder, 2- and 4-cylinder sizes, from 3 to 56 hp. Write for "Spec" Bulletin S-207.



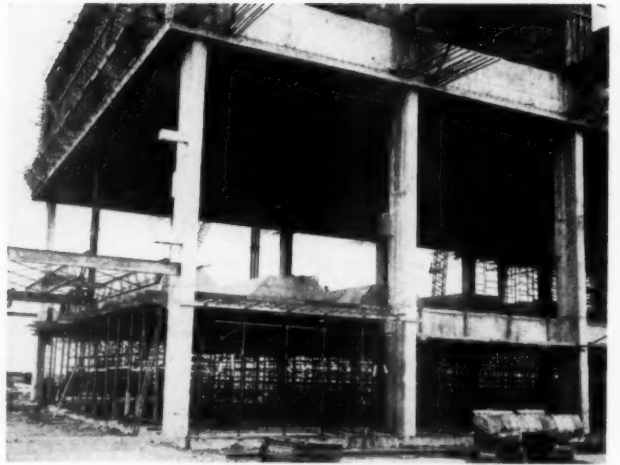
WISCONSIN MOTOR CORPORATION
World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 46, WISCONSIN

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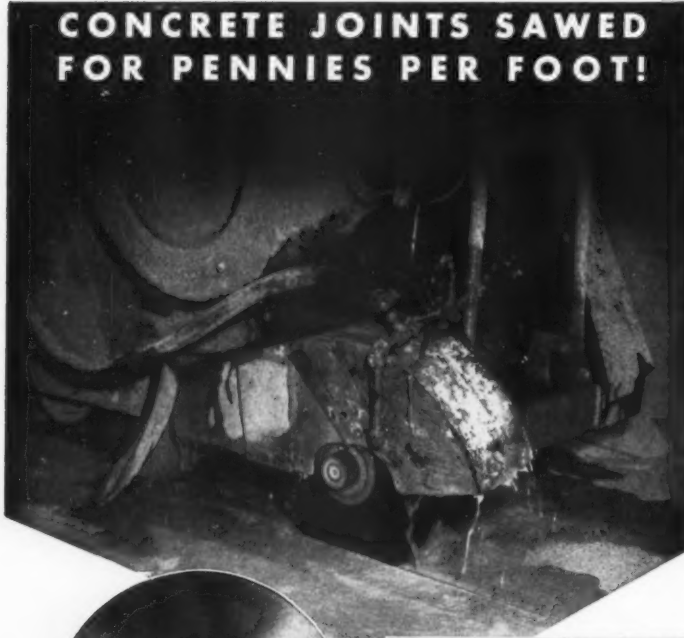


Working from Beaver-Advance scaffolding, men set Symons form panels for one of the heavily reinforced anchor walls.

Forms are set for the folded-plate second floor of the central bay. Both this and the third floors will be suspended from the anchor walls. Corrugations 3 feet deep and 15 feet center to center will create ducts for the air conditioning system when the floor slab is laid.



CONCRETE JOINTS SAWED FOR PENNIES PER FOOT!



Sawing road joints to control cracking is now required in 19 states.

BAY STATE'S NEW REINFORCED ABRASIVE BLADES give you tremendous advantages in economy. Actual experience on both highway and airport jobs shows costs per inch foot of cut between 1½ and 6 cents, depending upon the aggregate.

Specifically designed for wet cutting in green concrete, KRETE-KUT and SAF-T-CUT B22 blades are available immediately in all four thicknesses normally required by contracts. The standard 14" diameter readily handles all the depths usually specified, and arbor holes are made to fit each of the popular concrete saws.

Testing KRETE-KUT and SAF-T-CUT B22 is the best way to get the lowest concrete cutting costs! Contact your local BAY STATE DISTRIBUTOR, or write to us in Westboro for details.



BAY STATE ABRASIVE PRODUCTS CO.,
Westboro, Mass., U.S.A.

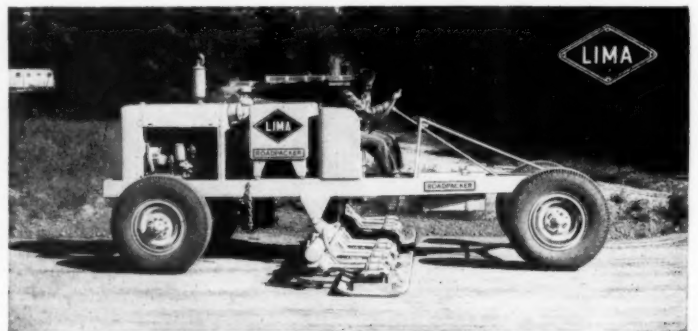
For more facts, use Request Card at page 18 and circle No. 434

second and third floors of the central section are suspended from the anchor walls by hangars, which eliminate the need for intermediate columns in the first floor area.

The cantilever roofs are concrete folded-plate sections, consisting of a series of angular corrugations extending out at right angles from the center section. Made of lightweight concrete, the roofs range from 3½ to 7 inches in thickness. The corrugations have a rise of 5.75 feet, and a

complete section is 30 feet wide.

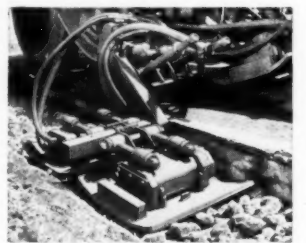
Since this is the first structure of its kind, the design itself was a major engineering feat. The design engineers were Burns & McDonnell, Kansas City, Mo., with Ammann & Whitney of New York City serving as structural associates. The Public Works Department of Kansas City, Mo., which has a 30-year lease agreement with TWA, awarded the \$8.5 million general contract to a joint venture of MacDonald Construction



Cut your high-density compaction costs with the LIMA ROADPACKER

Macadam Bases—Coarse aggregate for bases up to 12 in. thick can be spread in a single layer, then uniformly compacted to final density by the Roadpacker over a 13 ft., 1 in. width. This single course construction, possible only with vibrators, reduces spreading time by half. Also it eliminates the need for backtracking all the equipment for the second pass; and contour shaping is done once—instead of twice. In waterbound work, the Roadpacker's tamping and vibrating action runs in screenings solid from top to bottom. Only three spreads of screenings are required, and much of the hand labor of spreading, brooming and rolling is eliminated.

Gravel Subbases and Soil Cement Bases—Specified density is obtained in one to three passes, depending on material and depth. Because the Roadpacker compacts equally well traveling forward or in reverse, there's no deadheading when two or more passes are needed. Vertical packing action prevents troublesome shoving on difficult materials and does not drift the spread down on super-elevations.



Widener Attachment—Vibrating shoes compact material in widening trench while Roadpacker runs on existing pavement. Easily adjusted for various width trenches.

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- **Low maintenance**—Rugged vibrator shoes are pressure lubricated and actuated hydraulically through a completely sealed system. There are no exposed moving parts, no oil levels to check, no breather holes through which oil can escape.
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- **Easy to operate**—Operator is above dust, away from engine heat and exhaust for maximum comfort and efficiency. He has excellent visibility... controls are readily accessible.

Get all the facts on the new Lima Roadpacker—write for your copy of the Roadpacker bulletin today.

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CONTRACTORS AND ENGINEERS



Before the roof forms are set, and while the Manitowoc 3000 Speed-crane with 100-foot boom and 30-foot jib has access to the center section, the rigs set heavy cable anchorages for the anchor wall.



Working 80 feet from the ground, men set one of the cable anchorages in the forms at the end of the anchor wall. One of the anchorages, right, is already completed. Anchorages will hold the ends of cables that support the suspended roof during roof pours.

Co., St. Louis, Mo., and Foster & Creighton Co., Nashville, Tenn., which operates as MacDonald-Creighton.

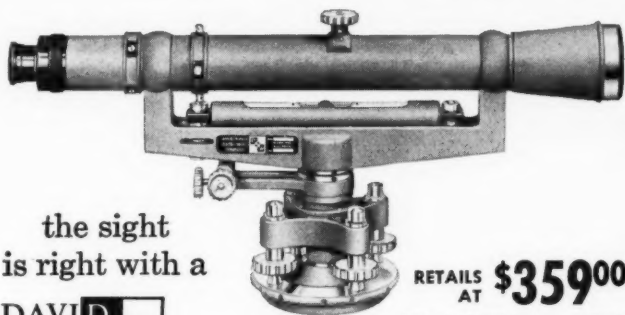
Building central section

Before awarding the hangar contract, the city constructed access aprons around three sides of the hangar under a separate contract. These 14-inch-thick concrete aprons, complete with flight-line facilities, were built by Sharp Bros. Construction Co.,

Kansas City, Mo. MacDonald-Creighton used this slab to keep their offices, supplies, and equipment out of the mud while building the hangar.

Excavation for the basement of the central area was also done under the apron-paving contract; the dirt moved by a spread of rubber-tire scrapers was used to fill a nearby low area. Spread concrete footings, the full length of both sides of the cen-

(Continued on page 110)



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is right with a

DAVID WHITE

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Write for NEW Instrument Catalog

7180 ENGINEERS' 18-INCH DUMPY LEVEL—especially developed for profile leveling, taking cross sections, setting slopes and grade stakes, sewers and pipe lines, railroads, topographic surveys and contouring. Engineered with unfailing accuracy... designed with fewer parts to eliminate wear and displacement. Before you buy, compare this White Dumpy level with a similar model of any other recognized make. From every standpoint—design detail... quality construction... work-speeding, life-lengthening features and cost—you'll quickly see why a White's the best buy you can make.

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7015 Engineers' Transit—ideally suited to the needs of engineers, contractors, surveyors... highways, bridges, roads, mines, forests, subdivisions, sewers, dams, farms, large construction, etc. Retail at \$665.00



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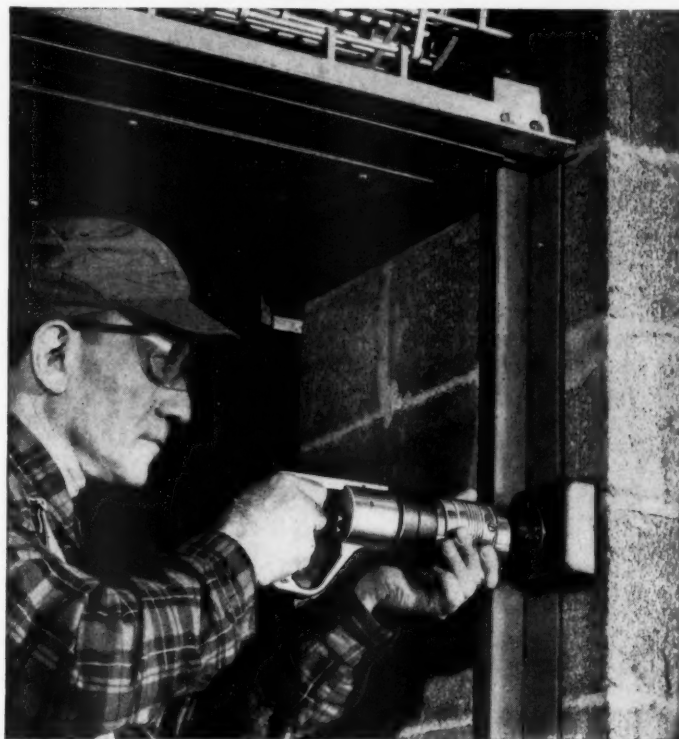
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Prices slightly higher west of the Rocky Mountains

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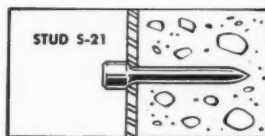
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No outside power source required—

Anchor metal door frames to concrete or cinder block in seconds with the Remington Stud Driver



¼" Remington S-21 Stud with 22 caliber Power Load is recommended for the application above... no pre-drilling required. There's a special stud to fit your needs, a Power Load to handle the job.

There's no time lost with this cartridge-powered fastening tool! It sets ¼" or ⅜" diameter studs in concrete or steel... up to six a minute, either size. Barrel change-over takes only 90 seconds *right on the job*. Over 40 Remington Studs to choose from, plus 22 and 32 caliber Power Loads scientifically graded to furnish *exact* power you need. Cuts costs, saves time on light, medium or heavy-duty fastenings!

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Please send me your free booklet which shows how I can speed the job and save with the Stud Driver.

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Work Bulls pay off

on every construction project

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Work Bulls provide the right tractor power with design-integrated attachments to build profit on these and scores of other jobs!

42 hp

DAVIS PIT BULL

(far left) is equipped with hydraulically controlled $\frac{3}{4}$ -yd. loader. Broom, blades, swinging crane or fork lift can be mounted on same loader frame and arms. The Pit Bull features a torque converter and combination foot feed and reversing clutches as standard equipment.

34 hp

WORK BULL MODEL 202

(center) with rear-mounted post hole digger that digs perpendicular holes even when working on slopes. PTO driven, the attachment can be used with either 8 or 12" augers. Other rear-mounted attachments include the Model 185 backhoe, reel and rotary mowers, multi-purpose blade and a pipe and cable layer. Front-mounted attachments include loader, blades, broom and fork lift.

52 hp

WORK BULL MODEL 404

(left foreground) is biggest, most powerful tractor in line. Available with gasoline or diesel engines it has five forward speeds and optional power steering. Model illustrated is equipped with low, direct-thrust $\frac{3}{4}$ -yd. loader and a fingertip-operated hydraulic backhoe which handles 12 to 36-in. buckets, digs to depth of $12\frac{1}{2}$ feet.

...as primary equipment

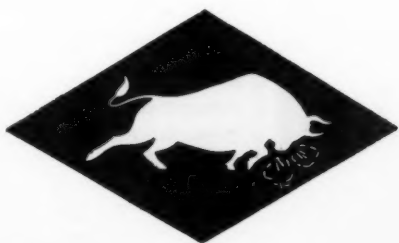
Work Bulls put former hand work on a paying power basis. With five tractors (34 to 52 hp)—choice of 20 *switch-in-a-smoke-break* attachments — Work Bulls pay off on small, scattered work-and-run jobs... earn their keep off-season, too, removing snow or handling other similar jobs.

...as backup machines

With Work Bulls you get the exact power/equipment cost ratio the job demands... increase equipment scheduling efficiency... cut down overhead. Work Bulls move from site to site through city traffic or cross-country... without permit troubles, without flat-bed and other costs.

...as utility or cleanup tools

When you're using shovels to clean up spill in the loading area, scrapers to smooth out haulroads, crawler dozers to pull wagons or skid light and medium-weight machinery—there's a profitable place for Work Bulls on your job. In fact Work Bulls help make your "big stuff" more profitable.



M·H·F WORK BULLS

Division of Massey-Harris-Ferguson, Inc.

12-F Quality Avenue

Racine, Wisconsin

For more facts, use Request Card at page 18 and circle No. 438



Reinforcing steel is set in roof forms prior to a pour. The 1 to 1 side slopes of the corrugated roof sections were poured first, a movable inside form faced with fine wire mesh being used to keep the form from floating out.

(Continued from page 107)

tral section, provide the foundations for the entire structure.

The heavily reinforced columns rise from the footings to the anchor walls. Because of the large number of heavy bars in the columns, there was not room for splices. Bars 74 feet long, embedded in the footing, stood like a series of tall cages until the columns were built around them.

The basement floor was cast on the ground, and the first or ground floor of the central section is of conventional flat-slab construction with drop panels supported on columns. But since the second and third floors were to be suspended from the anchor walls, they could not be built

until the columns and walls were complete.

Individual towers of Beaver-Advance scaffolding around each column provided access for the workmen setting the column forms and placing the concrete. Then scaffolding was set on the ground floor to support a complete 120x100-foot section of roof, together with the required anchor walls.

The 30-foot-high anchor walls were formed with Symons form panels. A continuous ledge along the bottom of each side of each of the anchor walls supports the roof of the central section. This roof was built of standard pan-and-joist construction with 12x30-inch steel pans and 6-inch joists spanning 21 feet between the walls.

To place the concrete in these high walls and roofs, the contractor used two Manitowoc 3000 cranes with 100-foot booms and 30-foot jibs. Transit mixers hauled from a plant on the site, discharging the mix into Gar-Bro buckets that were hoisted to the forms by the cranes. Bottom-dump buckets of 1 and 1½-yard capacities were used, together with 2-yard laydown buckets.

Hanging floors

The second and third floors of the central section are also of folded-plate design. Corrugations 3 feet deep and 15 feet from center to center run the 100-foot width of the section. The depressed portion of the corrugations is covered over with a concrete slab to form a smooth floor and to create a duct for the air-conditioning system.

Supporting these floors along the outer edge is a spandrel beam between the columns. At the second floor level, this beam was cast monolithic with the columns, but the beam at the third floor rests on corbels on the columns on Lubrite plates which permit movement between the columns and the floor.

The folded-plate floors span 50 feet from the spandrel beams to a center beam, which is suspended from the anchor walls on hangar rods. These floors, cast of lightweight concrete with Haydite aggregate, are just 4 inches thick.

Forms for the second floor slab were supported on towers of Beaver-Advance scaffolding resting on the ground floor slab. The forms were built of ¾-inch plywood backed by 2x4 joists, with trusses made of 2x4's forming the corrugations.

When the second floor had been formed and cast, it was suspended from the hangars and the scaffolding removed. The major portion of the third floor was poured on forms supported from the second floor; this job was done without reshoring.

While the central structure was being built, a subcontractor, John Rohrer Contracting Inc., Kansas City, Kans., was placing the concrete floor slabs for the side sections of the hangar. Rohrer set paving forms for 25-foot-wide strips of the floor and poured the concrete directly from

PERFECT BALANCE

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Even in close quarters
Hendrix Dragline Buckets
fill faster . . . handle easier
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A TYPE FOR EVERY DIGGING PURPOSE—¼ to 40 CUBIC YARDS

HENDRIX DRAGLINE BUCKETS

HENDRIX MANUFACTURING CO., Inc.
MANSFIELD, LOUISIANA

For more facts, use Request Card at page 18 and circle No. 439



The Manitowoc handles a section of wood form panel for the section of roof form supported by the scaffolding. The cables that will support this section of roof are coiled and hung from the anchor walls.

Stiff, heavy cables inserted in holes in the cable anchorage are strung into place by a crane. Sections of roof on opposite sides of the central section are completed at the same time so that cables can be tensioned simultaneously on both sides of the anchor walls.



transit mixers. A Jackson vibrating screed consolidated the concrete, finished the floors to grade, and troweled them with Whiteman power trowels. This subcontractor handled all of the cement finishing operations.

Suspended roofs

Included in the construction contract was the furnishing of two steel falsework "gantries", each designed to support a 60x150-foot section of the suspended roof. These gantries, which became the property of the owner, were built by Havens Structural Steel Co., Kansas City, Mo.

Each gantry consists essentially of two trusses spaced 30 feet apart and extending the 150-foot length of the section. The main crossbeams, which span between the trusses and cantilever 15 feet over on each side, are 24-inch WF beams. To form the corrugations of the roof, the contractor had 6-inch steel posts support 10-inch WF stringers which, in turn, supported the Mahon steel decking on which the concrete was placed.

In the traveling position, the gantries have flanged wheels riding three rails laid on the floor of the hangar. Forms were raised into place by pairs of Rotary lift hydraulic jacks provided under three points of each of the trusses. These jacks were capable of raising the form as much as 8 feet in a single lift. The minimum vertical travel actually required to clear the corrugations was just under 6 feet.

When the form had been jacked up to the desired grade, steel columns, pinned so that they could be swung in place, were set under the legs to take the load from the jacks. This done, the form was ready to receive the reinforcing steel and concrete.

These gantry forms worked very well; a crew of ten men was able to lower the falsework, move it to the next position, and raise it back into place to make it ready for reinforcing steel in one 8-hour shift. The complete cycle of stripping, moving, resetting, pouring, and suspending the cables took an average of nine days, and with overtime, the job was done several times in eight days.

To improve this schedule, the contractor augmented the gantries with two additional sets of forms that were supported on scaffolding. These 60x

(Continued on next page)

LET'S LOOK AT BMCO'S SELF- PROPELLED ROLLER

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HYDRAULIC STEERING

Controlled like an auto, stopped or in motion. Exclusive system gives gradual turning action that is fast enough to make a quick, short turn in less than a 20-foot radius.

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Choose a powerful gasoline or diesel engine. Compact motor-over-axle drive provides more ballast and is easily accessible for servicing.

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ON THE JOB TODAY

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Large automotive type hydraulic brakes on the four wheel drive differential. Quick, positive. Individual hand brake for parking.

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Hydraulic reversing unit with torque converter clutch gives instant change of speed and reversal of direction by operating a single lever. Rolling speeds are 2, 4, 8 and 13 mph at 1800 rpm engine speed.

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Manufactured by

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(Continued from preceding page)

150-foot forms, one on each side of the central structure, were started from the opposite end of the hangar and advanced toward the gantries.

These auxiliary forms, supported by a forest of Beaver-Advance scaffold towers that rose more than 40 feet from the hangar floor, were made of prefabricated wood panels. They consisted of a 3/4-inch plywood facing backed by 2x4 frames. Trussed timber framework on top of the tubular steel scaffolding supported the form panels.

Though the system was more cumbersome to move than the gantries, it was capable of being lowered with surprising speed. When the hinged plywood forms were dropped from under the pour, the scaffolding was low-

ered by screw jacks so that the entire section could be moved ahead on pipe rollers to the next position, then jacked up into place.

The scaffolding for this phase of the work, together with that used in forming other sections, came to more than 5,000 Beaver-Advance tubular steel scaffold bents. The project manager estimated that more than \$15,000 worth of scaffolding was in use during much of the job.

Though the contractors considered pumping concrete to the roof, uncertainties in pumping the Haydite concrete to this height made them turn to the crane-and-bucket method. In the few places where the long booms of the Manitowoc cranes could not reach, concrete was transported by four Whiteman power buggies.

Steep slopes formed

The 1 to 1 side slopes of the corrugated roof sections were placed first. The contractor originally planned to place this concrete without a top form by using a float and a small vibrator to compact and finish the surface. This method was abandoned in favor of one calling for a moveable inside form faced with fine wire mesh.

The top form for the steep slopes was made up in 12-foot sections, nicknamed "mules", that spanned the width of the corrugations. Each mule consisted of three timber trusses built to the shape of the corrugations. They were 9 feet wide at the bottom, 21 feet wide at the top, and approximately 5 feet high. Spanning between the three trusses on the sloping faces were 2x4 purlins laid flatwise

and spaced at 10-inch centers. A 1/4-inch hardware wire cloth was attached over the purlins to serve as the face of the form.

These mules were well braced and solidly built to withstand rough handling, and they were fitted with cable slings so that cranes could pick them up and move them from place to place.

In preparation for concrete placement on a folded-plate roof section, several of the mules were set end to



While the high center bay is being built, workmen prepare for the floors that will be laid under the outer bays of the hangar. Barco rammers are being used to compact the subgrade.

end to form the sides of one of the corrugations. The concrete was placed by crane and bucket and worked down behind the form with small vibrators. Though the main reason the open hardware wire mesh was used was to help the forms from floating out, it also permitted the escape of air while retaining the concrete, and permitted workmen to see that they had worked the concrete into every part of the section. It also held the concrete up, giving the vibrators a chance to consolidate the mix and work out the large air pockets.

The Haydite concrete seemed to be rough on vibrators, and the contractor used many kinds including Master, Homelite, Dart, and Mall in trying to pick the most satisfactory type.

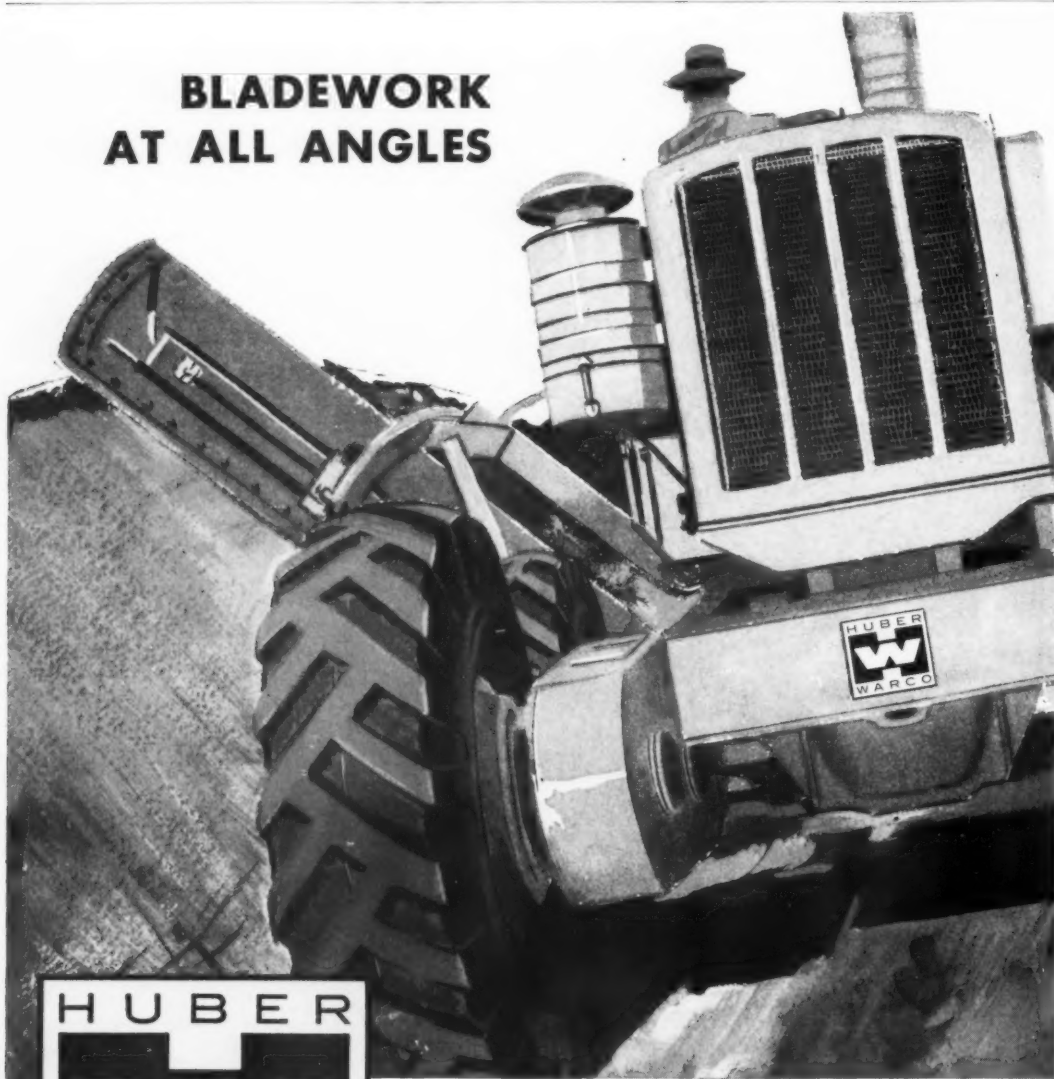
With the concrete in place on the sloping sides, the mules were left in place an average of about 45 minutes to permit the concrete to set. When they were picked up by the cranes and set ahead to new positions, concrete was placed on the flat top and bottom portions of the corrugations.

One roof section, containing nearly 10,000 square feet of concrete surface, was placed in a single working day. A large number of test cylinders were taken during the placement to insure accurate control in determining when the concrete had gained its required strength. The lightweight concrete mix was designed to produce 4,000-psi concrete, and the specifications required that the falsework could not be removed until a minimum of 2,400 psi had been attained.

Tensioning cables

Before the roof forms were set and while the cranes still had access to the central structure, the 2 1/4-inch cables were inserted into the anchorages at the top of the anchor walls and the heavy coils of cable left hanging. After the roof concrete had been

BLADEWORK AT ALL ANGLES



HUBER-WARCO MOTOR GRADERS

Whether the job calls for bank-sloping, back-up pass or just moving the blade out a little farther to pick up a windrow . . . there's no problem. Any desired blade position is possible on the Huber-Warco motor graders, and each position is hydraulically controlled from the cab through the exclusive saddle design and power-sliding moldboard. There are no manual adjustments to be made. There are 10 standard transmission and torque converter models available ranging from 75 to 195 h.p. See your nearest Huber-Warco distributor for details.

HUBER-WARCO COMPANY

MARION, OHIO

placed, the four cables at each end of each wall were strung out and inserted in the anchorage sleeves of the roof. Too heavy to be handled by hand, the cables were strung into place by a crane.

Sections of roof on opposite sides of the central structure had to be completed at the same time, since the symmetry of the structure demanded that the cables be tensioned simultaneously on both sides of the anchor walls. When the test cylinders showed that sections of roof on both sides had attained the required strength, the tensioning operation began.

Using Rodgers hydraulic jacks attached to the outer ends of the cables, the tensioning crews first applied a load of 50 kips on cables passing through the anchorage walls. This was actually a post-tensioning operation to put the concrete in the wall into compression.

The second step was to take up 100 kips at the outer end of each of the roof cables. This operation had to be done simultaneously from both sides, and the crews doing the jacking kept in constant touch with each other by radio.

A total load of 280 kips was then introduced into each of the cables through the anchor wall, and the final stress of 200 kips per cable was applied to the roof suspenders. Although this was enough stress to carry the roof, it usually did not result in a sufficient amount of deflection to free the forms. Using a vertical jack and a long timber pole, the crew jacked the roof up until the forms broke loose. The roof was then suspended in its final position from the cables.

When the roof sections were poured, a space about a foot wide was left open between adjacent sections to permit the new section to deflect during the cable-tensioning operation. After the forms had been removed, this strip was filled with concrete.

As soon as possible after the roof concrete was placed, it was sprayed with a coat of Magna-Tek waterproofing compound that served both as a curing compound and as a permanent waterproofing agent. Two additional applications of the same compound were made after concrete had cured. This three-coat waterproofing of the concrete completed work on the suspended roofs. The roof of the central section was insulated, then covered with a conventional built-up roof.

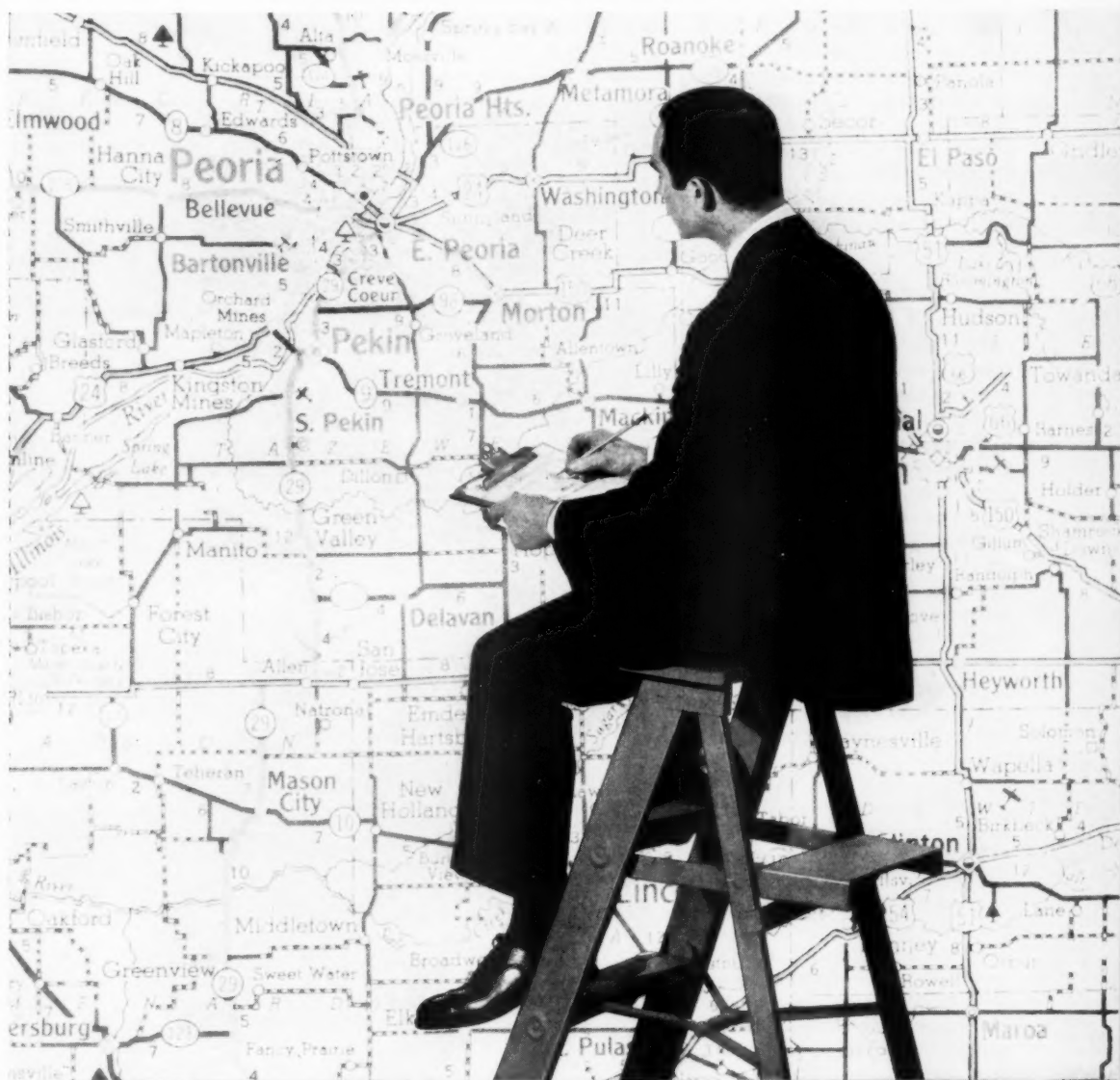
Doors extend to roof

The telescoping doors that slide horizontally to close the complete length of both sides of the hangar are made in two sections that are connected by a horizontal hinge. The vertical section stands ten feet or more out from the edge of the cantilever roof and rises almost to the height of the roof. The shorter, inclined section at the top is hinged to the vertical section and travels on rails on the roof.

This design permits the vertical movement of the edge of the cantilever roof—movement resulting from

(Concluded on next page)

This Johnson plant at the site provides the concrete needed for the overhaul structure. The 80-yard bin has 4 compartments, one for cement, and a 500-barrel cement silo, background. At right is the 2-compartment 75-ton bin for the Haydite aggregate used in the mix. Bins are charged by the Koehring crane.



This man has solved a major road building problem

with a **Materials Interchange Plan** . . . Materials availability is a critical problem confronting highway construction authorities. At least one Midwestern state has licked this problem with a **Materials Interchange Plan** that includes Asphalt. Specifications and designs are for alternate types of construction. Roads will be built with materials available at time of construction. No redesigning and rewriting of specs. No delay in the highway building program.

Make this your plan. With a **Materials Interchange Plan** for highways under your authority, roads may be built on schedule from materials available.

Remember these facts: Standard Oil produces Asphalt at four convenient Midwest locations. Tank car and tank truck deliveries are made to you from the Standard Oil refinery nearest your job. Technical Service on Asphalt for highway construction is provided by Asphalt construction specialists who work out of 23 Standard Oil offices all over the 15 Midwest and Rocky Mountain states. Standard Oil has a record of taking care of its customers demonstrated by its delivery on contracts in times of short supply as well as when materials are plentiful.

Get more facts about **STANDARD Asphalt** from the Standard Oil office nearest you. Or write Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.



STANDARD OIL COMPANY
(Indiana)

For more facts, circle No. 442→

changes in temperature and live load—and at the same time increases the usable width of the hangar by 10 feet. The mechanically operated doors can be opened to provide a clear unobstructed opening 540 feet wide.

At the west end of the central structure, a one-story service building was constructed. This 100×145-foot structure has a structural steel frame and masonry walls. At the east or front end, a three-story office building measuring 54 by 100 feet was constructed. This unit has a structural concrete frame with masonry walls and brick and stone exterior.

The ends of the hangar wings under the cantilevered roofs are closed by extremely unusual precast-concrete sections. The individual sections, 4 feet wide and 45 feet long, were cast in the form of a bent channel with flanges 4 inches thick and a web only 1½ inches thick. The sections, standing on end, were raised and placed by a crane using a two-point pickup. They attach to the roof by pipe sleeves that permit vertical movement as the roof raises or lowers with changes of temperature or live load.

Concrete production

The 43,000 cubic yards of concrete required for the structure, batched from a plant located on the site, were mixed in transit mixers. Included in the volume were 17,000 cubic yards of lightweight concrete made with Haydite aggregate.

The Johnson batch plant contained a 4-compartment, 80-cubic-yard elevated bin, one compartment of which was used for cement. In addition, there was a 500-barrel cement silo and an elevator feeding both the silo and the bin. This bin was used to proportion the cement and aggregates for the standard types of concrete. A separate 2-compartment, 75-ton bin was used to proportion the Haydite aggregates for the lightweight concrete.

Water from the municipal supply at the airport was stored in a 10,000-gallon tank fitted with steam coils. A stationary boiler provided steam to heat the water during cold weather. The batches of aggregates, cement, and water were charged directly into four Smith 6-yard mixers carried on Mack B-42 trucks. These rigs mixed the concrete and delivered it to all parts of the project.

Fire!

During the course of the job, a form section caught fire within eight hours after concrete had been placed, damaging a considerable amount of concrete and burning the form supports completely away, leaving the green Haydite concrete entirely self-supporting.

Subsequent tests and examinations showed that a large area of previously placed concrete had spalled and been seriously damaged by the flames. This area was repaired with pneumatic mortar. But the freshly poured concrete was undamaged. Apparently, it had been steam cured by the combination of the heat of the fire and the presence of excess curing water. Cores cut from this concrete showed

a strength of more than 2,000 pounds at 18 hours.

Subcontractors playing important roles in the building of the hangar included Holman Erection Co., Minneapolis; Minn.; which placed the reinforcing steel; J. Livingston Co., St. Louis, Mo.; Elus Inc., Kansas City, Kans., the mechanical and heating contractor; and Grinnell Co., Kansas City, Mo., which installed the fire protection system.

The giant hangar, which TWA calls an airframe overhaul structure, is the second major unit in the huge TWA overhaul base at the new Midcontinent International Airport. The first unit, a power plant overhaul building completed a year ago, is now in use.

Other projects completed at the base have been the grading and pav-

ing of a 6,000-foot-long, 150-foot-wide runway, together with an accompanying taxiway; the construction of aprons; and the extension of the municipal water supply out to the airfield, which lies some 15 miles northwest of the city. Additional runways and taxiways are planned for construction in the near future. The new airport and the TWA overhaul base are being built by Kansas City and financed by a series of bond issues totaling \$26 million.

Personnel

Supervising all of the construction operations on the big hangar was project manager Louis Boos of the MacDonald-Creighton joint venture. On his staff were superintendent Loren Hendron, engineer H. F.

Gamble, and office manager Chet Price.

The staff of Burns & McDonnell included Tom Crutcher, Ray Kistler, and Joe Runyan, resident engineers; Wm. N. Marshall, Jr., mechanical engineer; Charles Hooker, structural engineer; Tola Thompson, concrete technician, and Milton A. Davis, clerk-of-the-works. Winfield McClinton was field engineer, and Lloyd Lasher, structural steel superintendent.

The Kansas City Department of Public Works is headed by Reed McKinley, director of public works. The director of aviation is R. M. White and the chief engineer of the public works department is Stanley C. Palmer. The city manager is L. P. Cookingham.

THE END

Here's the greatest Steel Formever offered!!

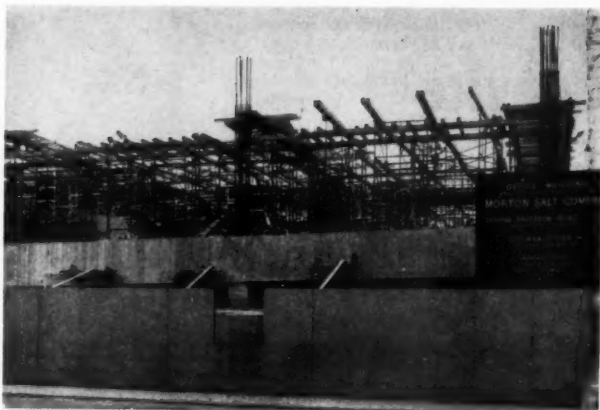
HIGHWAY AND AIRPORT FORMS

Redesigned Road Forms engineered by America's foremost form builder, are stronger, easier to align, faster setting than ever before. Built to contractors specifications, these new forms will take plenty of punishment and give years of service. They are now available with or without upturned base flange.

Heltzel's husky Dual Duty Forms have long been the favorites of contractors who build airport runways and ramps. These forms come in a number of double faces to enable contractors to pour two slab thicknesses with the same form.

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Advance scaffold shoring system used by Sherman Olson, Inc., of Chicago. Bays of scaffolds are in place and ready for forms prior to pour.

Case history

Tubular scaffolding cuts shoring costs

Substantial savings of time, materials, and labor through employment of Advance tubular scaffold for the shoring of concrete slabs, beams, and drop panels were reported by Sherman Olson, Inc., Chicago contractor.

The Olson Co. is general contractor for the 6-story, reinforced concrete building being erected in Chicago for the Morton Salt Co. Manufactured by the Beaver-Advance Corp., the shoring system consists of a series of 6½, 5, and 4-foot scaffold panels, with accessory items including shoring heads and brackets, adjustable bases, and foot plates. A single bay of the scaffold is said to

assure ample strength to support concrete slabs up to 24 inches thick and beams 6 feet in depth.

Because of the flexibility of Advance tubular steel scaffold, the equipment is also being used as towers and platforms for erecting column caps, for reshoring following the stripping of slab forms, as knee brackets for outside walks, and for the bracing of motor bases and curbs, according to the Chicago firm.

The report indicates increased economy in nailing, little or no lumber loss, and ample space for worker movement with equipment between bays of scaffold. The latter improvement has meant safer working conditions and a consistently low accident rate.

For further information about Advance scaffolding, write to Beaver-Advance Corp., Dept. C&E, Box 792, Ellwood City, Pa.

Circle No. 148.

New Pa. highway unit to speed engineering plans

A new unit in the Pennsylvania Department of Highways, designed to expedite the preparation of construction plans by contract engineering firms and to assist district engineers in checking specifications and standards, is headed by E. E. Gilham.

The new unit will coordinate contract engineering plans—formerly a job of the district engineers, and conferences formerly held in the central office and which required frequent trips by district personnel, consultants, and BPR officials to Harrisburg will be conducted in the district offices. This will eliminate costly delays and result in speedier decisions on construction and planning problems.

The primary function of the unit is to guarantee that all construction plans developed by contract are prepared in accordance with department standards and specifications. It will also be responsible for maintaining production schedules. The personnel will keep in constant touch with the contract engineering staff to check progress and for consultation.

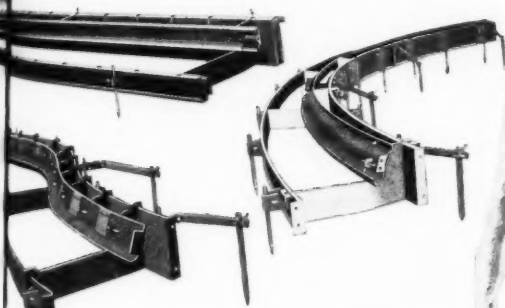
Weekly reports will be submitted to district engineers and to the central office on the character and degree of progress being made on assigned projects.

Six qualified engineers have been assigned to assist in the work. Leonard J. Curran, district engineer at Pittsburgh, will handle contract engineering in five western districts in addition to continuing his work as district engineer. Jack Wolf will coordinate work in two districts, and James Whalen, formerly a district maintenance engineer, will do the same in another two districts. All three, registered professional engineers, have served more than 20 years with the department.

Area engineers assigned to the unit are N. H. Harper, Jesse Imler, and R. S. Kepner.

Form Value

CURB AND GUTTER FORMS



Heltzel builds the widest variety of curb and gutter forms in the industry. Straight, flexible or rigid radius forms in any face and style. You'll want to know about the combined curb and gutter forms with the interchangeable sections that permit many styles from the same basic design... a real cost saver!

SIDEWALK FORMS



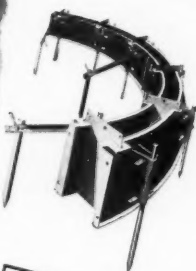
Here's an improved design sidewalk form with built-in Heltzel quality that assures lifetime performance. Division plate slots are spaced in one foot increments for better pouring practice.

HELTZEL STEEL FORMS

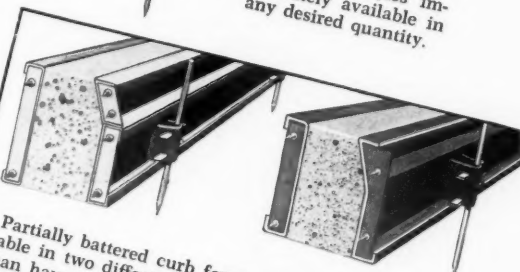


CURB FORMS

Heltzel Curb Forms now have full length stake pockets that add to form rigidity—make staking faster, more positive. Forms are made of prime steels

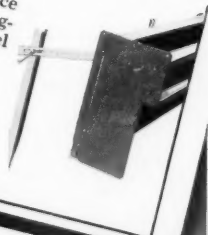


that have rerolled rail stakes. Battered or straight face in any radius styles immediately available in any desired quantity.



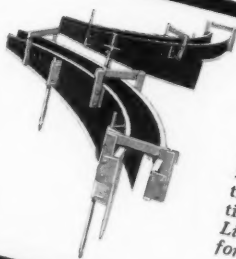
Partially battered curb forms are available in two different types. Contractors can have either the single or two piece form. Both have the strength and ruggedness that is typical of Heltzel Steel Forms.

Adjacent forms for adding curbing to slabs already in are available in the widest variety of combinations.



SPECIAL FORMS

Whatever your forming needs it pays to specify Heltzel Forms. Heltzel will build forms to meet any specifications — for islands, foundations, driveways, piling, etc. Literature available on all form types and styles.



THE HELTZEL STEEL FORM AND IRON CO., 414 THOMAS RD., WARREN, OHIO

For more facts, use Request Card at page 18 and circle No. 443



Roy N. Hill, mechanical engineer and consultant to Leap Concrete, Inc., points out the threaded clevises on his novel mobile lifting device. The use of the rig saved Prestressed Concrete, Inc., Lakeland, Fla., the cost of using two cranes for the lifting job.

Unique device hoists heavy beams

Hoist uses jack placed between top of beam and fulcrum of lifting device to pick up 71-ton precast members



How can a jack lift a beam when it is bearing against the beam itself? Roy N. Hill, Lakeland Engineering Associates, Inc., Lakeland, Fla., provided the answer to this when he figured out a way for the LEAP franchised plant of Prestressed Concrete, Inc., Lakeland, Fla., to lift and move 71-ton beams without tying up a crane.

The job of lifting the beams was not done merely as a tour de force. The 34 beams, 100 feet long and 11 feet high, are being used on a new American Cyanamid Co. chemical storage building, and they had to be cast at the rate of one per day. Four had to be moved off the bed to storage the same day. This is usually a job for a mobile crane, but the 71-ton weight of the beams was too much for any available crane and using two cranes for each moving operation would have made costs soar.

Jack used by hoist

Hill solved the lifting problem by designing a hoist that uses a jack placed on top of the beam to be lifted and under the end of the fulcrum of the lifting device. This fulcrum was pinned by threaded clevises to lifting bolts cast vertically into each end of the beam. As the jack was elongated, it lifted the beam, even though the

Cedarapids helps Florida Turnpike Authority achieve

THE LOWEST COST PER MILE OF ANY MAJOR TURNPIKE IN THE COUNTRY!

By producing 2,000 tons of low-cost specification bituminous concrete per day, this big Cedarapids G60 plant did more than its share in helping Florida complete its Sunshine State Parkway at the lowest cost per mile yet! The all-automatic G60 kept well ahead of the whirlwind paving program in spite of a difficult aggregate problem.

This plant is one of two G60's owned by Rea Construction Company of Charlotte, N. C., which is well set to beat competition on any job demanding big-quantity production of highest quality bituminous concrete.

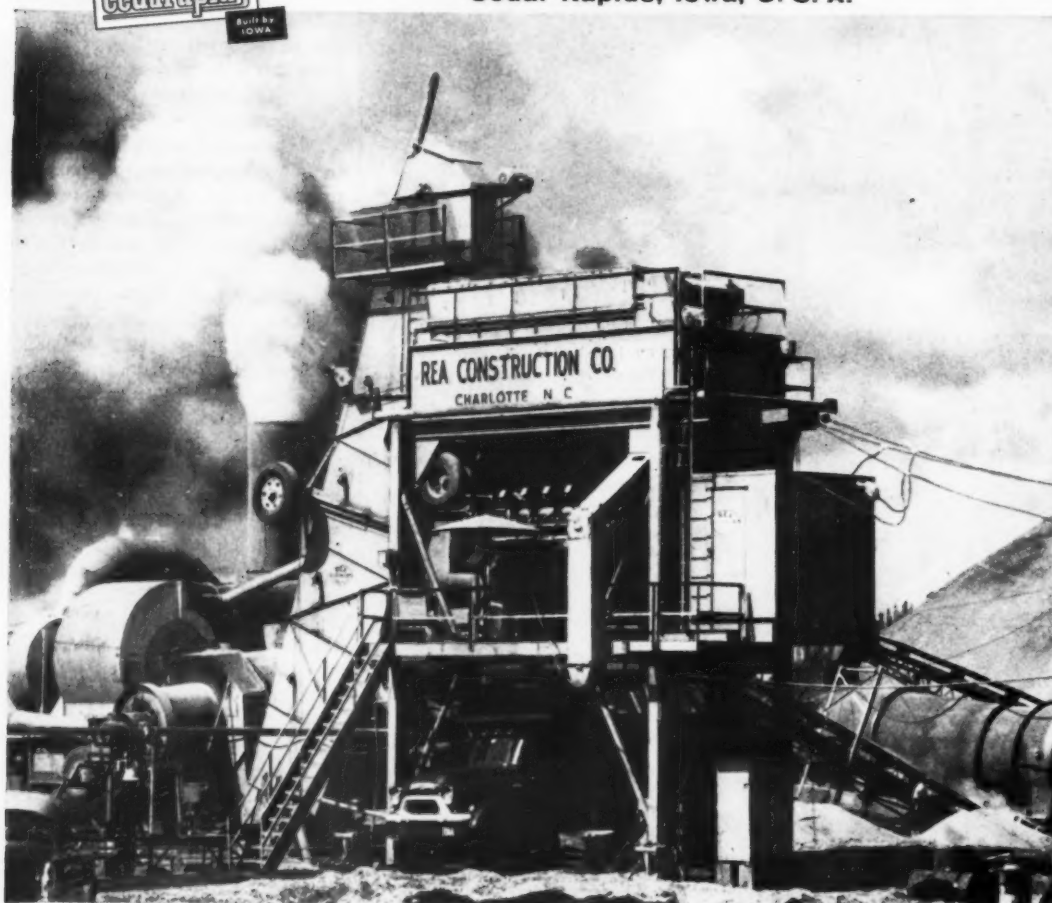
It takes G60 design and efficient operation to handle big turnpike or airport paving contracts

at the most profitable levels. All-automatic operation clips seconds off cycle time and controls the mix to meet strictest specifications... there are no profit-eating delays for changeover from mixing binder course to producing wearing course, or providing various mixes for the drive-in trade... and typical Cedarapids-Quality construction cuts maintenance costs to the absolute minimum.

And remember... if you need less production for smaller jobs, you'll get the same high profit margin with a Cedarapids G40 or H15 plant. Ask your Cedarapids distributor for information about the complete Cedarapids bituminous mixing line before you bid on your next job.



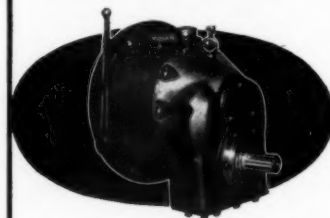
IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa, U. S. A.



For more facts, use Request Card at page 18 and circle No. 444

S-N

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For use on Gasoline and Diesel engines... 7 models... cut-off clutch... 40 to 755 HP range... gear ratios 1:5.1 to 4:1... up to 3300 lbs/ft engine torque. Write for complete information.

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THE SNOW-NABSTEDT GEAR CORP., HAMDEN, CONN.

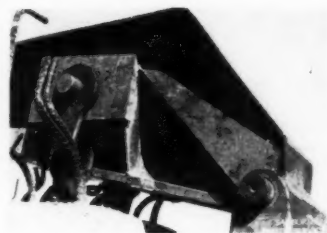


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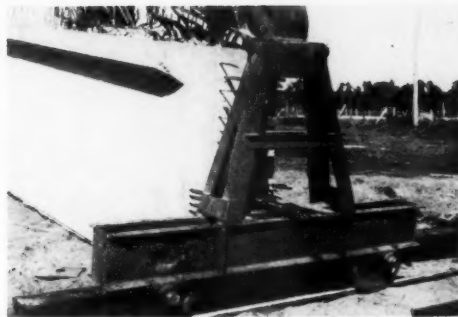
CONTRACTORS AND ENGINEERS

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Forged and threaded clevises, attached to lifting bolts cast vertically into the ends of the beams, pin the fulcrum of the lifting device to the beam as the jack is elongated.



When the 100-foot-long, 11-foot-high beams are lifted, the horizontal bolt on the lifting device takes the horizontal thrust from the beam. The device rolls on rails to bring the 71-ton beam to the storage area.

jack was bearing against the beam being lifted. A horizontal bolt on the lifting device took the horizontal thrust from the beam. The whole frame rode on rails so that it could move sideways to the storage area once the beam had been lifted.

During the actual lifting operation, an available truck-mounted crane was used to activate the lifting device, which required only 8 tons to lift the 35½-ton load at each end of the beam.

Pours bring beams to 91 tons

The chemical storage building being constructed for the American Cyanamid Co. will be 40 feet high, 100 feet wide, and 960 feet long. The structure, which will not have interior columns, is being built with precast exterior columns, walls, and beams. The roof deck will use LEAP Double Tee prestressed slabs supported by the 100-foot-long prestressed beams. Each of the beams will receive a 20-ton composite pour, bringing the weight of each individual beam to 91 tons.

All structural designs for the building were prepared by Lakeland Engineering Associates, Inc., Lakeland, Fla., and DeWitt, Furnell, & Spicer, St. Petersburg, Fla., is the general contractor.

THE END

BPR text details road, bridge specifications

"Standard Specifications for Construction of Roads and Bridges on Federal Projects", published by the Bureau of Public Roads, is primarily intended for use on projects under the supervision of the Bureau.

The latest specifications for work items, materials, and construction methods are contained in the book, and they can be applied to Federal highway contracts. The two main chapters cover general requirements and construction details—earthwork, bases, surfacing and pavements, structures, and incidentals. The specifications contained in the book cannot be used for federal-aid highway work performed by the states with funds administered by the Bureau, since each state prepares its own specifications subject to the Bureau's approval. Formulas, charts, and tables supplement material in the 363-page book.

The book can be purchased for \$2.00 from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

JUNE, 1957



...and the NEW DAVIS 210 BACK-HOE is the ONLY MACHINE in the World— that can do this job!

When it comes to digging a footing or any other trench for service lines, waterproofing, etc., right alongside another building, you have only two choices—either expensive hand digging or fast, economical flush digging by a new Davis 210 Back-hoe. The new Davis 210 can be mounted at either end of the frame—as well as at the center so you can dig flush with walls, fences, etc. Its 200° swing lets you dump far enough from the trench that removal of the excess pile with the Davis Loader, America's quality loader, is easy.

It's all made possible by the exclusive rotary hydraulic boom swing cylinder along with the other features which make Davis the world's largest selling back-hoe—features like the 7000 pounds of breakaway for digging in asphalt or frozen ground, independently controlled hydraulic stabilizers, five minute detachability, and revolving seat which lets the operator always watch his work. Of course with the Davis Loader you have an unbeatable combination...all for far less than you would expect to pay in comparison to other makes.



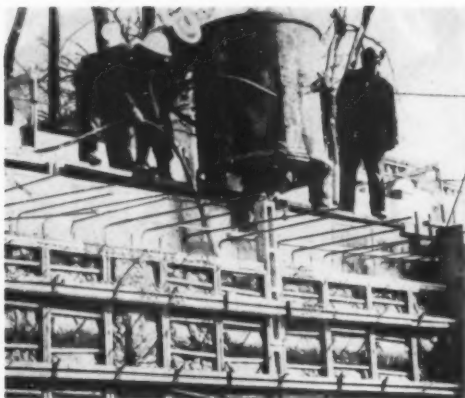
FOR MORE PROFIT

Davis Loaders and Back-hoes are available for all popular makes of tractors, and sold and serviced everywhere in the U. S. A. and Canada by better dealers. For the name of your nearest dealer call Western Union by number and ask for Operator 25...or write...



MID-WESTERN INDUSTRIES, INC.
1009 SOUTH WEST STREET DEPT. B WICHITA 15, KANSAS

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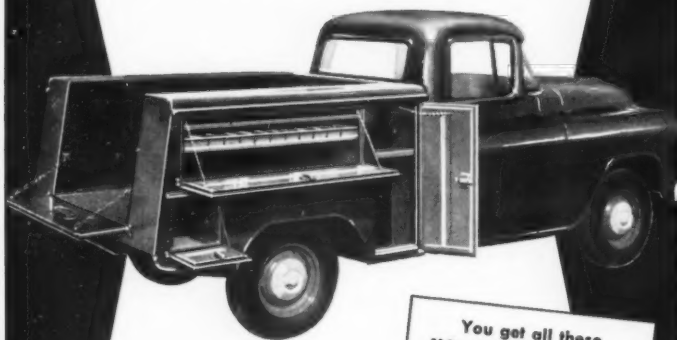


Concrete in January. Symons prefabricated forms plus balsam wool insulation eliminated tarpaulins, heating units for a Wisconsin contractor.

Service-Master[®]

for '57 is

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Compartments are now 14½" deep...2" deeper than ever. More space for large boxes and cans—for more tools, parts, and supplies, too. Cargo area, which stretches 48½" between compartments, has a tread-plate steel floor that really fights back when it comes to rough treatment. Models for old or new ½, ¾, 1, and 1½ ton chassis.

Available for immediate delivery in all 48 states

Optional equipment includes telescopic roof, ladder racks, pipe racks, vise bracket, and bumper-step. Canopy Top, shown here, furnishes more fully-enclosed cargo area.



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AUTO BODY CO.**

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McCABE-POWERS AUTO BODY COMPANY
5900 North Broadway, St. Louis 15, Mo.
Please send me descriptive literature and name of my nearest SERVICE-MASTER distributor.

NAME _____ TITLE _____
COMPANY _____
ADDRESS _____
CITY _____ ZONE _____ STATE _____

For more facts, use coupon, or Request Card at page 18 and circle No. 447

Case history

No tarps, heaters needed with insulated forms

How a contractor produced quality forming on a foundation job started in January, and saved 50 per cent on the cost of heating and curing the concrete, is told in a report by C. R. Meyer & Sons Co., Oshkosh, Wis.

The feat was accomplished on the new \$1 million central office building of the Wisconsin Telephone Co. at Oshkosh. Meyer did it by teaming balsam wool insulation produced by the Wood Conversion Co., St. Paul, with Symons Standard Wood-Ply panels. The contractor used double thicknesses of the 2-inch insulation in 24-inch widths tacked to the forms.

The pour was started when outside temperatures ranged from 5 to 25 above zero. It involved 450 cubic yards of concrete—22,000 square feet of forming for which 7,000 square feet of Symons forms was used. The

12-inch-thick walls varied in height from 12 to 16 feet.

Close temperature records were kept—concrete at the time of the pour was held in the 70 to 80-degree range. After 72 hours the temperature between the backside of the forms and the insulation was 82 degrees, although the atmospheric temperature during that time never rose above 25 degrees.

This forming system with balsam wool insulation not only replaced the normally costly methods of tarpaulins or protective enclosures, but also eliminated the fire hazard of heaters on the job.

For further information about Symons prefabricated forms, write to Symons Clamp & Mfg. Co., Dept. C&E, 4249 Diversey Ave., Chicago 39, Ill.

Circle No. 154.

Documentary film covers AASHO Illinois test road

"Test Road, U. S. A." covers the most ambitious experimental highway construction program in the nation's history—a test road near Ottawa, Ill., sponsored by the American Association of State Highway Officials. The 18-minute, sound, color film is available from the Seaman-Andwall Corp., Milwaukee, Wis.

The film covers the entire field of operations, and shows the latest in roadbuilding equipment, methods, and techniques in grading and sub-

grade stabilization. Some of the equipment used on the test road was especially designed for the job to achieve the standards specified by AASHO engineers. Highway officials from every state, the Highway Research Board, and officials from Hawaii, Puerto Rico, and the District of Columbia participated in the test program.

Film showing information can be obtained from the Seaman-Andwall Corp., Milwaukee 1, Wis.

Curtain wall developments topic of meeting, exhibit

The Kawneer Co., Niles, Mich., has presented the latest developments in lightweight glass and metal building skins at a meeting and exhibit in the Hotel Commodore, New York City, on May 28. The affair was sponsored by

the New York Chapter of Producers' Council.

The speakers presented data on curtain wall types, techniques, problems, and construction. Curtain wall components were exhibited.

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data with ...

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"Oriented Diamond"
DRILL BITS

Foundation exploration costs less with Hoffman Bits because they eliminate guessing about formation structures for quick, accurate job estimates. Exposing only the sharp, hard diamond edges to the work. Hoffman Bits cut rather than scrape. They produce clean, smooth cores at lower footage costs—use less power—last longer. Designed and tested for each application. Hoffman Bits are the answer where core drilling accuracy and economy are important.

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For more facts, use Request Card at page 18 and circle No. 448

CONTRACTORS AND ENGINEERS



Two 365-foot-high material-handling towers used on a new building in Vancouver, B. C., lifted everything from steel and concrete to form work and plaster. They were used 10 hours per day and frequently have been in operation around the clock.

Case history

Materials towers pass rugged test

Two of the tallest materials towers ever used in Western Canadian construction were erected for the new British Columbia Electric Bldg., Vancouver, B. C. Used for lifting everything from steel and concrete to form-work and plaster, the units have worked approximately 10 hours per day and frequently have been in operation around the clock.

T. A. Beg, equipment superintendent of prime contractor John Laing & Son (Canada) Ltd., reported that quite frequently 100 cubic yards of concrete was lifted by one tower within 7 hours. In all, about 800 tons of steel have been carried up, and 10,000 cubic yards of concrete.

Other materials carried up by the towers, which were manufactured by the American Tubular Elevator Co., include shuttering, plasterers' materials, tiles, staging, tanks, and electricians' materials. The towers reached a maximum height of 365 feet during their period of use.

The dichromate galvanized finish used on the towers is said to have protected them from the corrosive effects of salt atmospheric conditions.

For further information about its materials towers, write to American Tubular Elevator Co., Dept. C&E, 700 North St., Zelienople, Pa.

Circle No. 190.

A-C buys firm, opens Australian subsidiary

Allis-Chalmers Mfg. Co., Milwaukee, Wis., has established a new wholly owned subsidiary in Australia, the Allis-Chalmers Australia Pty. Ltd., and through it has purchased the assets of Thomas C. Pollard Pty. Ltd., Newcastle.

The Pollard firm was owned by

Tutt-Bryant, Ltd., A-C dealer in Australia. The plant will continue to make motor graders as it previously did under license from A-C, and will expand production to other construction machinery.

C. A. Rechner is supervising A-C's Australian operations.

STEEL SCAFFOLDS

SWING SCAFFOLDS

WORK PLATFORMS

HOIST TOWERS

TUBULAR STEEL SCAFFOLDING

for every "off-the-floor" job!

Contractors in more and more trades are making Bil-Jax their headquarters for all scaffolding equipment needs! Simplicity, sturdiness, safety and low cost are stand-out features. For scaffolding that's "just right" for your kind of job, insist on Bil-Jax.

GET THE FACTS!

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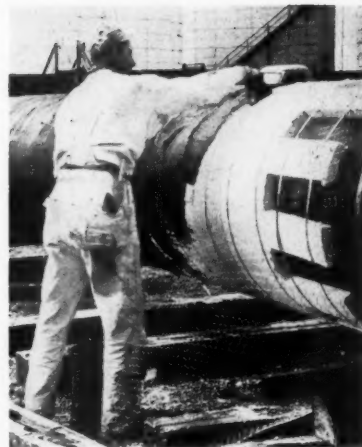
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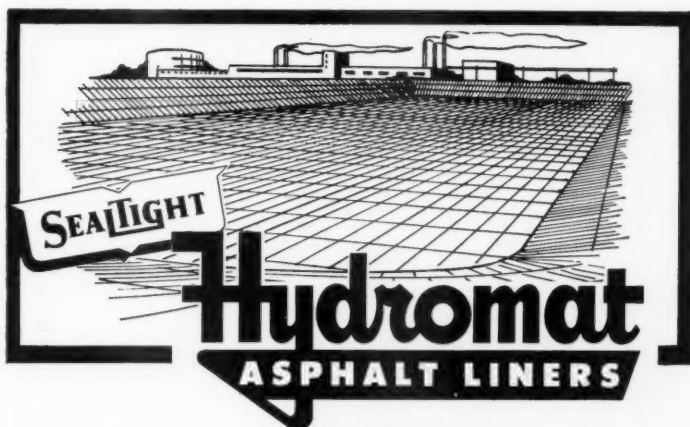
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ALL-PURPOSE SCAFFOLDS

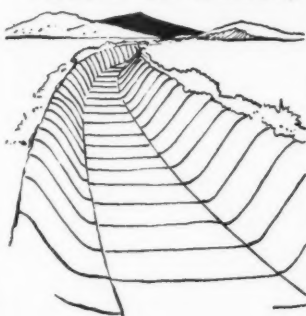
SHORING EQUIPMENT



Case history: By insulating a refinery boiler smoke stack prior to setting it on its permanent foundation, a contractor eliminated the need for scaffolding. The surface was covered with galvanized poultry wire which served as reinforcement for application of Laykold Weathercoat, a cold-applied asphaltic protective material. For further information about Laykold Weathercoat, write to American Bitumuls & Asphalt Co., Dept. C&E, 200 Bush St., San Francisco, Calif. **Circle No. 165.**



... insure the **COMPLETE** containment of water, wastes, sludges and sewerage in ...



- IRRIGATION PROJECTS
- INDUSTRIAL RESERVOIRS & WASTE CONTROL PONDS
- MUNICIPAL WATER AND SEWERAGE PROJECTS
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"Hydromat" hydraulic mats, developed and manufactured by the leading manufacturer of asphaltic products for over 30 years, were developed in a scientific manner to provide a lining material that would allow the COMPLETE containment of water, wastes, sludges, sewerage, etc. "Hydromat" is installed as a monolithic liner, with mechanically sealed joints, that will expand and contract with soil movements without rupturing or

breaking the seal. "Hydromat", a fully exposed type of lining, may be installed quickly and easily by untrained labor ... make-ready requires only a minimum of time and effort. "Hydromat" provides the practical answer to the problem of efficiently relining old, cracked concrete or gunite linings. "Hydromat" hydraulic mats are produced in sheet sizes 4' wide up to 12' long ... available in thicknesses of 5/32", 1/4" and 1/2".



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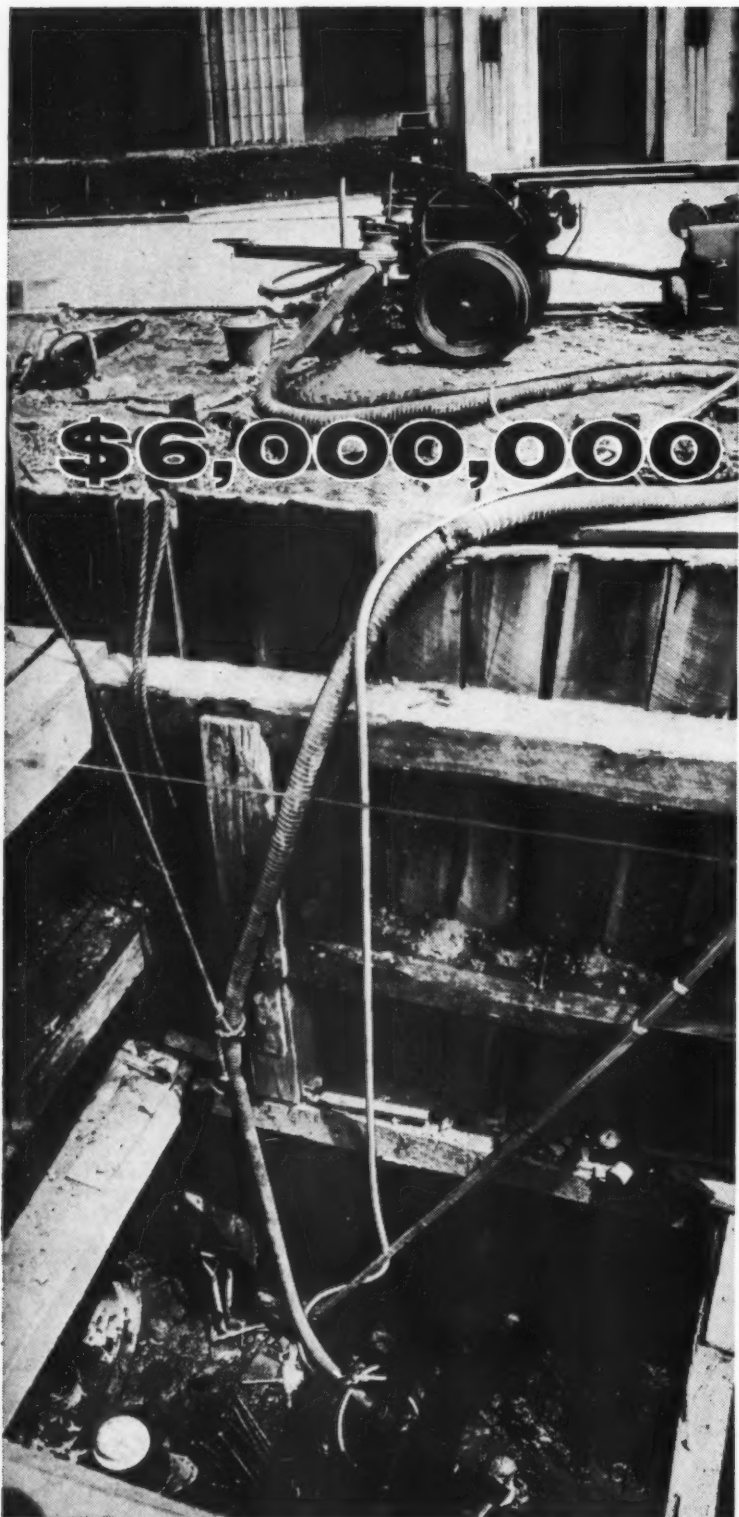
WRITE TODAY ... for your copy of our "Hydromat" TECH-TIPS covering complete technical data on the uses and installation of "Hydromat" Asphalt Liners.

W. R. MEADOWS, INC.

13 KIMBALL ST.

• ELGIN, ILLINOIS

For more facts, use Request Card at page 18 and circle No. 450



Sewer Project Under Construction

Sewage Bypass and Seepage Solved by Marlow Pumps

The City of Hoboken, New Jersey, is currently engaged in improving its sewer system and erecting a new sewage disposal plant . . . a project that will eventually cost the city \$6,000,000. Work on the sewer line was started in May, 1956, by Berlanti Construction Company at Newark and First Street and will be ended at Seventeenth and Jefferson, 2½ miles away, where the new plant will be located.

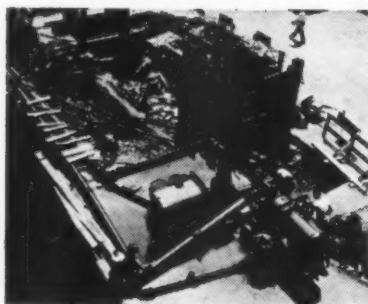
Dewatering the trenches that were dug to lay the new sewer pipe was a 24 hour a day job because water from the Hudson River was constantly seeping into the excavation. To cope with seepage, Berlanti used more than 20 Marlow "Mud Hogs" and self-priming centrifugal pumps.

At one point during the construction, Berlanti used two Marlow self-priming centrifugal pumps to by-pass raw sewage. Running alternately, 24 hours a day, these two big engine-driven pumps handled 1,400,000 gallons and during the peak periods as much as 1,700,000 gallons per day.

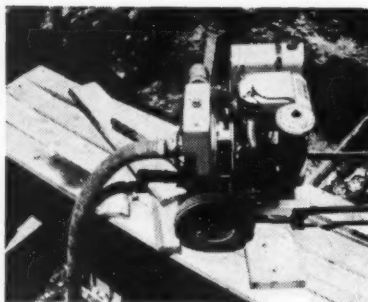
Even though running on a round-the-clock schedule, these Marlow pumps turned in enviable performance records. According to Jack Hunter, Berlanti Master Mechanic, the pumps did a good job with very little maintenance required. He's more than satisfied with them.

If you have a tough dewatering problem, look to Marlow for your answer. Marlow builds a complete line of AGC rated contractor pumps as well as famous "Mud Hog" diaphragm pumps for handling muddy and trash laden liquid. For complete details write today for a copy of Bulletin C-04 and the name of your Marlow dealer.

This Marlow "Mud Hog" diaphragm pump, working on a deep suction lift, removes muddy, trash laden seepage water from the bottom of a sewer trench.



These two big Marlow self-priming centrifugal pumps were used to bypass raw sewage during the construction of the sewer line. The pumps handled as much as 1,700,000 gallons per day.



Berlanti Construction Company used small Marlow self-priming pumps for dewatering service on this sewer line project. These portable, dependable Marlows could be placed anywhere and do the job well.



6-270

**DIVISION OF
BELL & GOSSETT CO.**

Midland Park, N. J.

Morton Grove, Illinois Longview, Texas

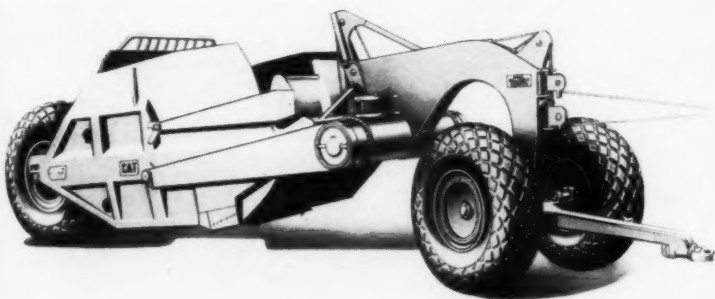
CONTRACTORS AND ENGINEERS

For more facts, use Request Card at page 18 and circle No. 451



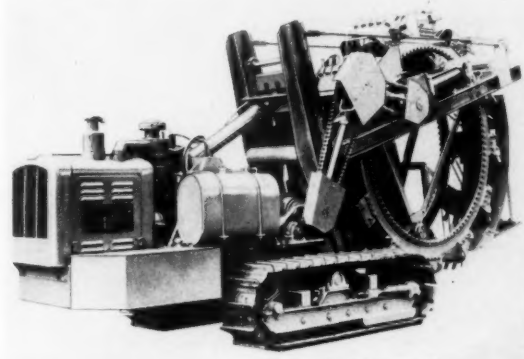
PRODUCT PARADE

For further information on any of the products described in the following section, circle the designated number on the Request Card at page 18.

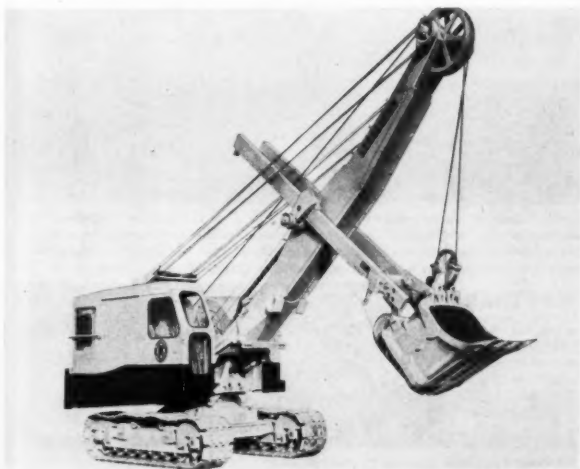


A new large-capacity scraper for use with the D8 and D9 tractors has been announced by the Caterpillar Tractor Co. The No. 491 replaces the No. 90 scraper in the Caterpillar line, and its payload capacity of 82,000 pounds is 12,000 pounds greater than that of the predecessor model. The new unit features a struck capacity of 27 yards and a heaped capacity of 34 yards, representing an increase of 26 per cent. The apron opening has been increased to provide an additional 15 inches, and this feature, combined with higher bowl sides and other changes, is said to facilitate thorough, positive ejection. Tubeless tires provide both stability and good flotation. The three-piece cutting edge, good operator visibility, low maintenance cost, and high maneuverability are other features. Caterpillar Tractor Co., Dept C&E, Peoria, Ill. **Circle No. 172.**

The Parsons Co. has added a heavy-duty Trenchliner, the Model 170, to its line of wheel-type trenching machines. A feature specially stressed is a hydraulically driven conveyor that provides belt speeds up to 600 fpm, yet works completely independent of the wheel speeds. As a result, the manufacturer claims, it is possible to place spoil at a convenient distance from the trench wall when wheel speeds are slowed due to tough digging conditions. The machine will produce from 12 inches to 25 feet of trench per minute in a range of 30 digging speeds. Maximum digging depth is 5 feet 9 inches. A selection of seven cutting widths extending from 20 to 32 inches in 2-inch increments is available. The digging wheel is hydraulically raised and lowered on a vertical mast; a separate mast tilt ram holds the mast vertical and tilts it forward for proper balance and clearance. Power is furnished by either a 60-hp gasoline or 54-hp diesel engine. The Parsons Co., Dept. C&E, Newton, Iowa. **Circle No. 112.**



Koehring's line of excavators is augmented by the new crawler-mounted Model 805—a unit which may be used as a crane, 2 to 3-cubic-yard dragline, up to a 3½-cubic-yard clamshell, or a 2-cubic-yard shovel. Equipped with friction-type steering brakes that are spring-set and air-power released, the new excavator is said to turn within its own length when one crawler track is completely locked. The bucket is crowded into the cut by a heavy roller chain. A high A-frame, power raised or lowered, is standard equipment on all models using booms 75 feet long or longer. Six turntable and six hook rollers assure operating stability and evenly distribute the machine's weight under any digging or lifting strain. Antifriction bearings are used on most shafts. Koehring Div., Koehring Co., Dept. C&E, 3026 W. Concordia, Milwaukee 16, Wis. **Circle No. 74.**



Four models of an air-cooled engine tractor from Germany's Porsche-Diesel works are now available to American contractors. Distributed in this country by Porsche-Diesel Imports, Bridgeport, Conn., the line includes a 4-cylinder, 44-hp model—the P-144—designed especially for construction applications. Because of its unique air-cooled engine, the P-144 will not freeze up or overheat. Other advantages said to result from air cooling are greater power, faster warming, constant performance, fuel savings, and reduced wear. Another feature of the imported tractor is fluid drive, said to protect not only the entire mechanism, but also any implements attached, from shock when ground obstacles are encountered. The P-144 is equipped with two power take-off shafts, one running at standard speed and the other working independently of the clutch. The unit is slightly over 9 feet long, 6 feet high, has a 6½-foot wheelbase, and weighs 4,630 pounds. There are five forward and reverse gears. Porsche-Diesel Imports, Dept. C&E, 39 Sylvan Ave., Bridgeport, Conn. **Circle No. 227.**





An all-new 27-cubic-yard version of the fast-loading Fullpak scraper is offered by LeTourneau-Westinghouse Co. The new unit is designed to operate with the Model B Tournapull, which has also been completely restyled for heavier, more rugged duty and easier maintenance. The new Fullpak boasts a longer blade, larger bowl, and easier loading. The floor of the scraper stays nearly flat in loading, with only a 1-degree floor tilt when the blade is on the ground. LeTourneau-Westinghouse Co., Dept. C&E, 2310 N. Adams St., Peoria 2, Ill. Circle No. 47.

There's a MIL-CARB® Washer Back of Each Nut... and for Very Good Reasons!



Today, riveting is taking a back seat in favor of high strength steel bolting . . . for economy, speed, safety, quietness, higher fatigue resistance and permanent joining of structural steel members. Here is progress at work!

And because you are an essential part of this progress, you are a potential or present user of MIL-CARB heat-treated washers . . . the "tremendous trifles" that can be worth their weight in gold!

It is logical to assume that no high strength bolt assembly is any better than its washers. "Washer failure" must be guarded against at all costs . . . but with MIL-CARB Washers there is no cost penalty. Nuts may be torqued up to specification maximums without danger of galling or grinding of the washer. And because these high quality washers are uniformly flat, the bolt, nut, washer and structur-

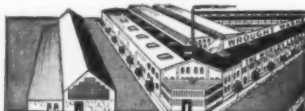
al steel become a tight, permanent, integral whole.

All MIL-CARB washers are fabricated from Prime Heat-Treat Special Soundness Steel, to insure uniform quality control . . . always equal to rigid specifications (ASTM designation: A-325 applying to nuts, bolts and washers).

Leading consulting engineers and contractors recognize and applaud the leadership of MIL-CARB Washers in this relatively new, highly specialized field. As a guarantee of the unyielding permanence of your steel structures, specify MIL-CARB WASHERS.

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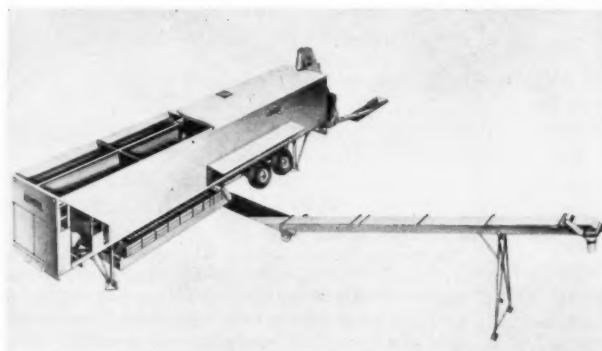
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WASHER MFG. CO.**

2118 S. BAY ST., MILWAUKEE 7, WIS.

THE WORLD'S LARGEST PRODUCER OF WASHERS

For more facts, use Request Card at page 18 and circle No. 452

Wagner Morehouse, Inc., offers this mobile crane featuring hydraulic tilting and telescoping action. The Rolahoist Model 25 crane has a rated lifting capacity of 50,000 pounds with the hook 4½ feet ahead of the blade. The hook can be extended out to 16 feet ahead of the blade, at which point the lifting capacity is 10,000 pounds. The one-man-operated rig has three speeds forward and reverse, and can attain a maximum speed of 35 mph. A bulldozer blade for light grading is an additional feature. Choice of gas, gasoline, or diesel power is offered. Optional features include four-wheel-drive and large single tires, both said to give the new crane a high degree of operational flexibility for a wide variety of jobs. Wagner-Morehouse, Inc., Dept. C&E, 5909 E. Randolph St., Los Angeles 22, Calif. Circle No. 49.



The newest product of the C. S. Johnson Co. is the Porto-Batcher, a portable batch plant that disassembles into three trailer units. Production for the new unit varies from 60 to 100 batches per hour, depending on batch quantities and truck sizes. An interlocked batch control with repeater is fully automatic. Aggregate capacity is 39 cubic yards in four compartments, or 46 yards with sideboards. The built-in water tank holds 650 gallons, while cement storage capacity is 280 barrels. Both batch truck and transit-mix truck discharge conveyors are available. Provision is made for connecting the plant to a nearby pressure water source. C. S. Johnson Co., Dept. C&E, Box 71, Champaign, Ill. Circle No. 54.

WOW!

15,000 Sq. Ft. of Wall Poured Without Snaptys or Wood Walers

Huge savings and better walls were realized on this job because the contractor used Rocform Concrete Forming Systems. This advanced method of forming concrete saves money in many other ways, too! Write us for complete details.



Portion of 300' x 110' poured concrete basement wall 8' to 10' high formed with Rocform Systems for Electrical Products Manufacturing Company, Montreal, Quebec. Entire wall was poured without use of snaptys or wood walers. General Contractor: David Bloom & Company, Montreal, Quebec. Basement Contractor: Rocwall of Quebec, Montreal, Quebec.

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Write us today for details on how you can own and operate a set of Rocform Systems. Easy terms available if desired. Factory representatives train you in operation and selling.

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WORLD'S LEADING PRODUCER OF CONCRETE FORMS

For more facts, use Request Card at page 18 and circle No. 453

CONTRACTORS AND ENGINEERS

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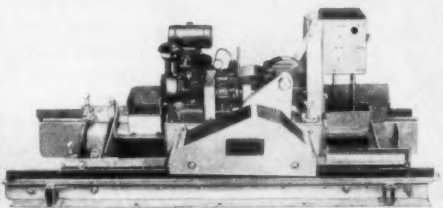
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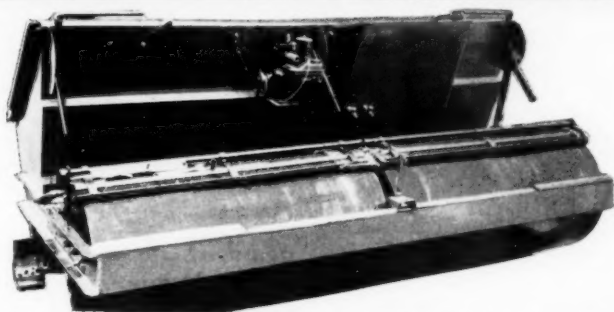


The International 1957 truck line, designated the A or Anniversary line to mark the firm's 50th year of motor truck production, ranges from a half-ton A-100 Series at 4,200 pounds gvwr to the heavy-duty, cab-forward, six-wheel ACF-180 Series at 33,000 gvwr. The line includes four and six-wheel and all-wheel-drive units, powered by gasoline or LPG engines, in conventional or cab-forward models. Nine 6-cylinder engines are offered, with horsepower ratings ranging to 154. Driver comfort has been stressed, with a lower, wider cowl and new 65-inch-wide cab among features of the new design. Cab-forward models offer lower and shorter chassis dimensions. There is no wheel housing in the cab of these models, so that access to the roomy cab is provided through a full door. A broad range of wheel bases, transmissions, axles, and other components is offered. International Harvester Co., Motor Truck Division, Dept. C&E, 180 N. Michigan Ave., Chicago 1, Ill. Circle No. 73.



The new Model S-57 curb and gutter paver introduced by Dotmar Industries, Inc., features several noteworthy improvements over earlier models. A vibrator mounted on the rear hopper is said to assure smooth flow of grout or concrete, resulting in smoother troweling. The hopper is mounted on rubber to prevent other parts of the machine from vibrating. A mechanical tamper with its tamping shoes operating in the forward hopper reportedly assures a more uniform concrete structure. A new clutch between the engine and wheel-drive transmission enables the machine to operate forward or reverse. The paver can thus be backed up for a second pass where necessary. The unit lays and finishes up to 10 linear fpm. It can be adapted for paving median strips. Dotmar Industries, Inc., Dept. C&E, 502 Hanselman Bldg., Kalamazoo, Mich. Circle No. 50.

OVERMAN STONE AND BITUMINOUS SPREADER



THE PAVING MACHINE DESIGNED AND BUILT BY A PAVING CONTRACTOR

... will do your work and cost you FAR LESS than most any other paver. Don't be deceived by appearances. This simply-built, easily-operated spreader will lay a pavement as good or better than other heavy complicated machines. It is not made for just the small jobs, but for ANY job... convenient for the small ones, speedy for the large ones. OVERMAN SPREADERS are saving time and money for contractors everywhere.

It will pay you to investigate before you buy. Let us prove to you that this machine will cost less to buy and less to operate.

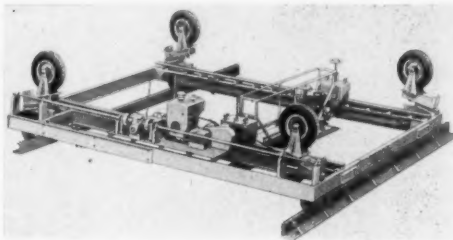
Write for
bulletin
today.

I. J. Overman Mfg. Co.
BOX 896 MARION, IND.

For more facts, use Request Card at page 18 and circle No. 454

A new line of Rex longitudinal float finishing machines in models of from 10 to 32-foot working widths is announced by the General Road Machines Division of the Chain Belt Co. Powered-frame widening is one of the major working advantages; the feature permits nonstop changes in working widths, in interchange and tapered-lane work. Transportation wheels are provided.

One engine powers traction wheels, while another powers screed travel through two separate 4-speed transmissions. The large float measures 12 feet in length and has up to a 12-inch lag for fast working under all conditions. The unit collapses for transport. General Road Machines Div., Chain Belt Co., Dept. C&E, 4701 W. Greenfield Ave., Milwaukee, Wis. Circle No. 158.



on a ROSCO SELF-PROPELLED ROLLER



YOUR OPERATOR will earn more money for you with Rosco's Model SR-9-0 nine wheel self-propelled, pneumatic tired roller. Here are some of the features that make this machine a real money-maker:

The operator's seat is located for all-around visibility and close operations without "blind spots". Heavy duty, automotive hydraulic power steering reduces operator fatigue...allows more concentration on the job. Ample power for all operating conditions from a heavy duty 4 cylinder, high torque gasoline or diesel engine... multiple speeds forward and reverse... high "over-the-road" travel speeds for fast changes to new job locations.

Rosco's large capacity body is designed for maximum ballast load for proper compaction. Special smooth tread tires provide an evenly rolled path of 69" with overlap. The short wheelbase permits a close turning radius. Drive is through heavy duty, high tensile roller chains and steel sprockets. These are enclosed and running in oil.

This modern, smooth operating SR-9-0 Roller in the hands of your operator will make more profit for you. Ask your Rosco dealer for a demonstration now or write for Bulletin 560B. It contains all specifications and information you'll want to know about Model SR-9-0.



ROSCO BITUMINOUS DISTRIBUTOR with Pressure Metering.
Front or rear mounted for truck or trailer.

Rosco
MINNEAPOLIS

THE BEST FOR BETTER ROADS

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DISTRIBUTORS • MAINTAINERS • ROLLERS

SUPPLY TANKS • TAR KETTLES • ROAD SWEEPERS • STREET FLUSHERS

For more facts, use Request Card at page 18 and circle No. 455



An Insley Type K unit with new arched hoe boom attachment.

Offer new arched hoe boom attachments

New optional arched hoe boom attachments for its Type K and Type L machines are now available from the Insley Mfg. Corp. Booth booms are of the same design and have two vertical sheaves near the boom mid-point and an enclosed horizontal sheave at the bucket.

The arched hoe bottom attachment for the Type K machine has a 16-foot 9-inch boom, 10-foot 2-inch arm (hinge pin to bucket teeth), and

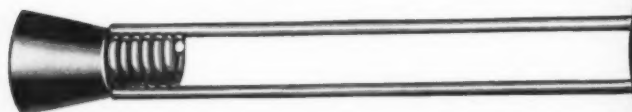
a digging depth of 19 feet 3 inches. The attachment for the Type L machine has an 18-foot 9-inch boom, 10-foot 2-inch arm, and digging depth of 19 feet 3 inches.

The new boom is said to be adaptable to all Type L machines and most Type K machines in the field.

Insley Mfg. Corp., Dept. C&E, P. O. Box 167, Indianapolis, Ind.

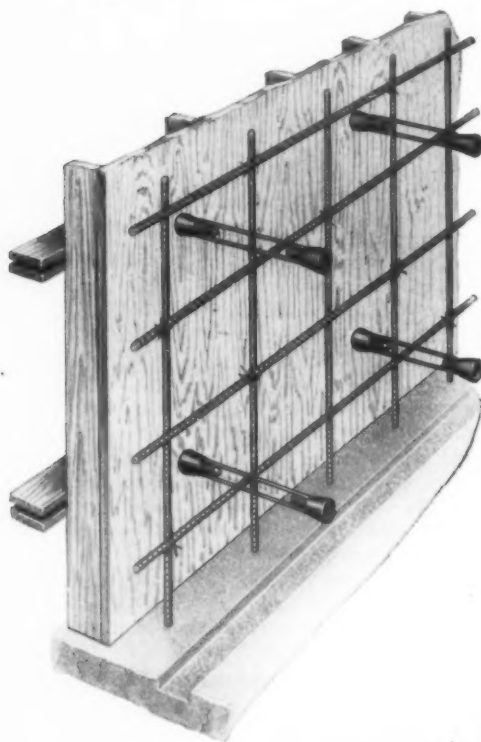
Circle No. 127.

Threaded CONES CUT FORM COSTS

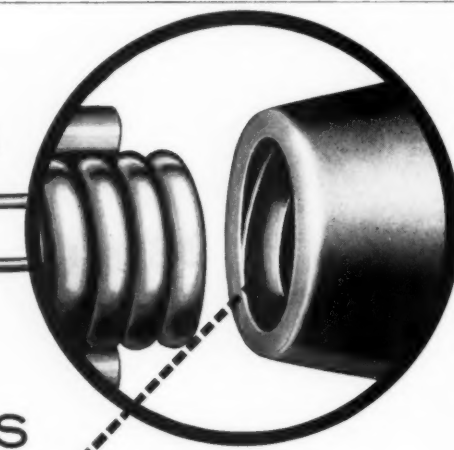


SUPERIOR Cone-Fast COIL TIES

Pat. No. 2,335,338



May be used with wood, combination wood and steel, and all steel form work for bridge piers and abutments, retaining walls, filtration and sewage disposal plants, and other engineering projects. Illustration above shows assemblies in place prior to erection of opposite form.



* Patented Threaded Cone Permits Extra Fast Erection of Forms!

Form erection crews can maintain extra fast schedules when using the Superior Cone-Fast Coil Tie Assembly because of a patented threaded feature whereby less than 2 turns of the Cone hold it securely to the Coil Tie. Designed especially for jobs where large panel forms are used for thin walls that do not permit a man inside forms, these *Threaded Cones* cannot be knocked off the Coil Ties when the opposing form is being applied. Here's an additional advantage . . . units may be bench assembled with the assurance that they will arrive at the destination point intact! Stripping is easier too . . . as the Threaded Coil Cones back out of the wall with a cone wrench.

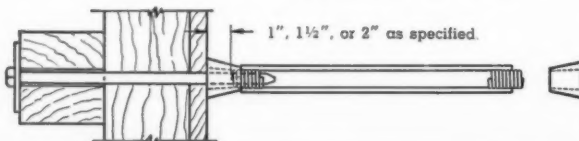
Cone-Fast Coil Ties with *Threaded* Coil Cones are supplied for 1/2" to 1 1/4" Coil Bolts with safe load capacities from 5,000 to 36,000 lbs. Working parts (Cones and Bolts) are returnable for credit.

When specifications require the tie metal to be 1" or 2" back of the wall face, Superior *Standard* Coil Ties are available.

For complete details request a copy of our new Catalog 600.

SUPERIOR CONCRETE ACCESSORIES, INC.

9301 King St., Franklin Park, Ill. (A SUBURB OF CHICAGO)
Pacific Coast Plant — 2100 Williams St., San Leandro, Calif.
New York Office — 1775 Broadway, New York 19, N. Y.



SUPERIOR



For more facts, use Request Card at page 18 and circle No. 456

Small air hammer has variety of uses

A new lightweight air hammer with a metering trigger has been announced by Superior Pneumatic & Mfg. Co., Inc. The Bantam Bully air hammer measures 6 inches long, weighs 20 ounces, and uses 6.5 cfm at 90 psi.

A metering trigger lets the operator control blows per minute all the way from 0 to 13,000 with just a light pressure of the finger. Twenty-four dif-



ferent tools for scaling, chiseling, peening, metal cutting, star drilling, and other operations are available for use with the Bantam Bully. A slip chuck snaps the various tools in or out easily.

According to the manufacturer, the Bantam Bully can be operated easily with one hand, leaving the other free to handle the work. The company also states that, because it has only one moving part, the new air hammer has a long life free from service troubles.

Superior Pneumatic & Mfg. Co., Inc., Dept. C&E, 4758 Warner Road, Cleveland, Ohio.

Circle No. 122.

Demountable spreader for road maintenance

An attachment that converts a general truck into an efficient calcium chloride, sand, salt, or chip spreader in 15 minutes is being marketed by the Fox River Tractor Co.

The driver controls the spreading operation with a simple lever mounted near the cab of the truck, eliminating the need for two or three-man crews. The unit has a capacity of 5 cubic yards and the driver can vary the width of the spread from 8 to 32 feet, as well as its density, at speeds of from 5 to 40 miles an hour.

The unit spreads material in front

CONTRACTORS AND ENGINEERS



Fox River Tractor Co. offers this new driver-controlled demountable spreader unit.

and behind the rear wheels, permitting the truck carrying it to move forward safely while traveling up and down hills.

The spreader, which weighs 2,500 pounds, is easy to install. A sling and crane or pulley can be used to position it on the truck bed and two tie rods on each side clamp the unit firmly in place. Adjustable shafts at the end lock into the tailgate clamps and brace it.

Key to the ease of operation is the patented Fox auger feed, instead of the customary chain and drag bar. This is said to give positive flow of materials to the spinner. No chains come in contact with materials, thus reducing wear, caking, or breakage. The auger is mounted on double roller bearings at each end. The spinner is driven by a Wisconsin 2-cylinder air-cooled engine.

When the spreading operation is completed the all-steel unit can be easily removed and stored and the truck released for other work. The spreader reportedly is adaptable for street and highway maintenance, street repairs, and roadbuilding.

Fox River Tractor Co., Dept. C&E, Appleton, Wis.

Circle No. 96.

Twin-cylinder hoists for dump trailers

The Daybrook Hydraulic Division of the L. A. Young Spring & Wire Corp. has announced a series of new Speedlift twin-cylinder hoists for trailer dump bodies.

The simplicity of direct-lift design is a feature of these new hoists, which combine maximum capacity with a minimum of moving parts to assure reliable trouble-free operation, the company reports. Increased lifting power is gained through longer stroke and greater cubic-inch displacement—all without sacrificing compactness of the unit.

Fifty-seven hoist models are listed for trailer lengths ranging from 14 to 20 feet, and body lengths ranging from 14 to 21 feet.

Daybrook Hydraulic Division, L. A. Young Spring & Wire Corp., Dept. C&E, Bowling Green, Ohio.

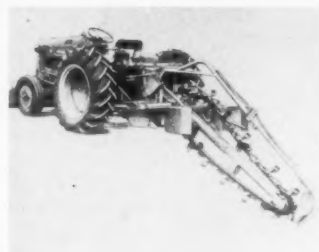
Circle No. 55.

Trencher available for I-H tractors

The Arps Corp. has announced the availability of its heavy-duty Trench Hog for the International Model 300 and Model 350 utility tractors.

The adaptation of the trencher to International tractors now makes the unit available for most wheel models.

The unit trenches at an average of 300 to 400 feet per hour under ordinary conditions, and can dig as fast as 800 feet per hour on narrow, shallower trenches. It is available in three boom sizes, with depth capacities up to 7 feet. Cutters can be quickly changed to give a range of trench widths from 6 to 20 inches. Special



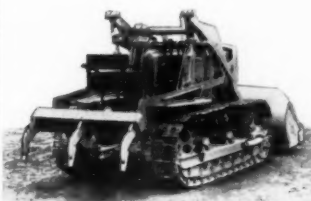
cutters are also available for rocky and frozen soils.

Arps Corp., Dept. C&E, New Holstein, Wis.

Circle No. 39.

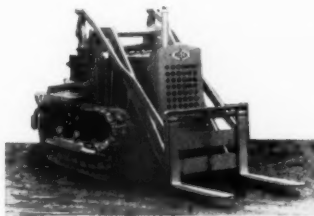
GREENVILLE ATECO LOADER and attachments for JOHN DEERE 420 CRAWLER

Here's America's biggest selling loader—designed specially for John Deere tractors. Proved on the job by thousands of owners. Unit has big reach . . . bucket clears 9' 5"—has 2' 6" reach in dump position and levels automatically as it raises. Bucket hinge pin adjusts for hydraulic tilt-back for fast loading with minimum spillage. Extra-heavy, lubricated pins and bushings at all hinge points are replaceable. See it at your John Deere dealer's now.



SCARIFIER

Speeds loading; saves wear and tear on tractor and loader; accommodates five shanks equipped with inexpensive, replaceable points.



FORK LIFT

Mounts easily in place of bucket. 66" bulldozer blade and crane hook attachments available.



STANDARD BUCKET

Handles up to 3/4 cu. yd.; accommodates 4 teeth; large bucket for light materials handles up to 1 cu. yd.

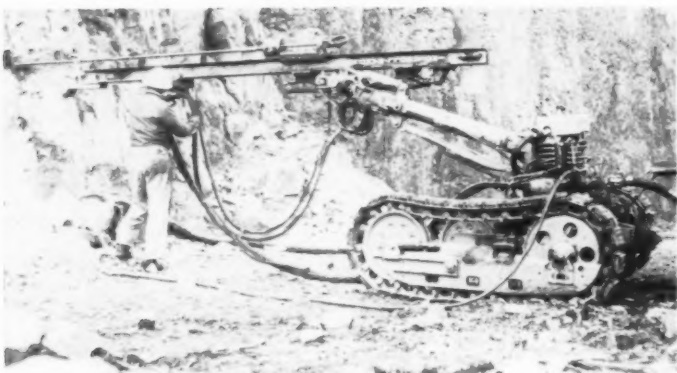


GREENVILLE

STEEL CAR COMPANY

ATECO DIVISION
Greenville, Pennsylvania

For more facts, use Request Card at page 18 and circle No. 457



The new Crawl-IR drill features hydraulically operated horizontal boom swing which allows a maximum hole spacing of 10 feet.

New self-propelled blast hole drill

A new, knee-action crawler drill known as the Crawl-IR has been introduced by Ingersoll-Rand. The completely mechanized, self-propelled unit is designed for wide application in roadbuilding, quarrying, and general excavation work.

Mounted on crawler tracks driven by air motors, the new drill features hydraulically controlled boom and feed-tower adjustments for faster, easier, and safer positioning of the drill. Two hydraulic cylinders operate the boom, allowing it to swing in a

horizontal arc of 85 degrees and a vertical arc of 82 degrees. Three additional cylinders position the feed-tower for vertical, horizontal, or angle-drilling from any boom position.

Hydraulically operated horizontal boom-swing allows a maximum hole spacing of nearly 10 feet. Horizontal holes can be drilled from ground level to 7 feet without moving the unit on its tracks. The boom itself is 5½ feet long and the feed tower is 15 feet high.

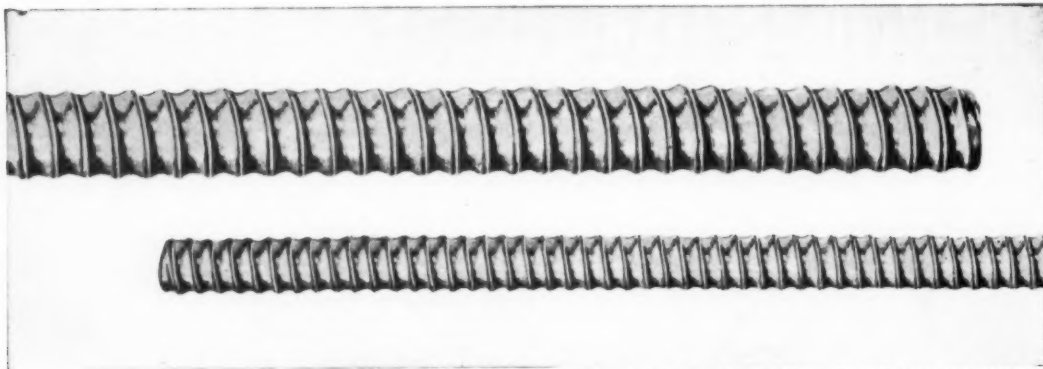
Centrally located finger-tip controls automatically position the feed tower, eliminating the need to move the heavy parts manually. Besides being a safety feature, this reportedly saves time and manpower formerly used to bring a drill into position. Time is also saved in movement of the self-propelled unit to the next group of holes on its own crawler tracks. The entire operation of positioning and drilling can be achieved by one man.

For its propulsion, the Crawl-IR employs two air motors that are reversible and independently controlled for steering in any direction. A knee-action frame allows the drill to move over any type of terrain. The air power needed for drilling and moving the unit may be supplied by an I-R Gyro-Flo portable compressor.

When moving into drilling position, the Crawl-IR can operate as far away from the compressor as the air hose will allow. After the job is finished, the drawbar of the compressor can be hooked to the drill, and the Crawl-IR will haul itself and the Gyro-Flo compressor to a new site. Equipment normally used to tow compressors and wagon drills need not be released from other important jobs, the manufacturer reports.

Ingersoll-Rand Co., Dept. C&E, 11 Broadway, New York 4, N. Y.

Circle No. 156.

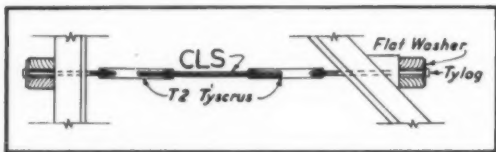


Richmond Continuous Threaded Lagstuds; available in ¼" to 1½" dia.

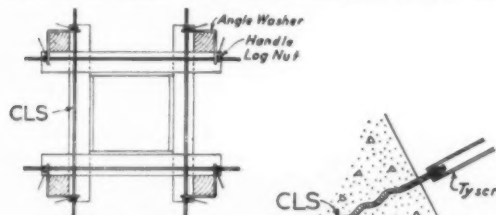
Concrete Form Tying Headaches Solved on-the-spot with Multi-Purpose Richmond Lagstuds

15% of concrete form tying work is "special"—hinging on conditions which develop as the job moves along. Before Richmond developed its Continuous Threaded Lagstuds on hand, now any job foreman can have the needed sizes quickly cut to length on the spot. They come in ½-inch, ¾-inch, 1-inch and 1½-inch diameters, threaded to fit the contour of the coil (helix) of the Tyscrus; in 5-ft. and 10-ft. lengths.

With a supply of Richmond's Continuous Threaded Lagstuds on hand, now any job foreman can have the needed sizes quickly cut to length on the spot. They come in ½-inch, ¾-inch, 1-inch and 1½-inch diameters, threaded to fit the contour of the coil (helix) of the Tyscrus; in 5-ft. and 10-ft. lengths.



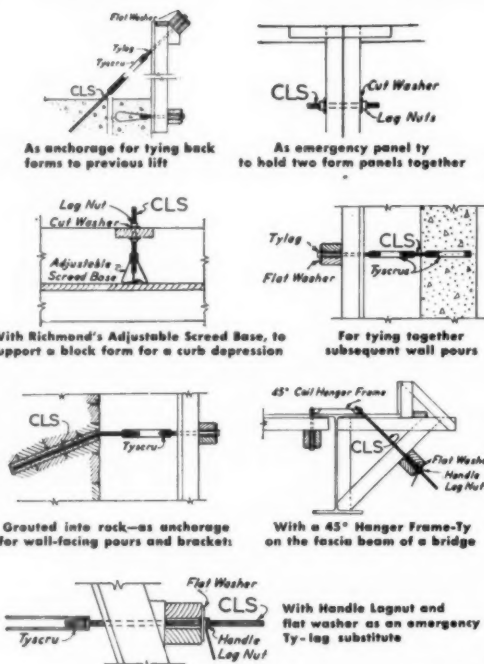
Lagstuds are among the most versatile members of the Richmond Tyscrus family. Used alone, or in combination with other Tyscrus products, they fill numerous other needs. Some of these uses are illustrated here.



With Handle Lagnuts for exterior column or bulkhead ties

When furnished crimped, as anchorage to concrete where additional anchorage is needed in winter or below-strength concrete

For more facts, use Request Card at page 18 and circle No. 458



The new Richmond Handbook describes the Richmond Adjustable Tyscrus System and the entire Richmond line in detail. It is yours for the asking. To get it—or for help in solving a particular concreting problem—write: RICHMOND SCREW ANCHOR COMPANY, INC., 816 Liberty Ave., Brooklyn 8, N.Y. or 315 So. Fourth St., Saint Joseph, Mo.



Heavy-duty truck boasts light weight

Diamond T's new diesel-powered Model 922 truck tractor features new lightweight design, yet is built around proven and accepted heavy-duty components. According to the company, the new model makes possible new, larger payloads; greatly increased operator revenue; and dramatically reduced costs per ton mile.

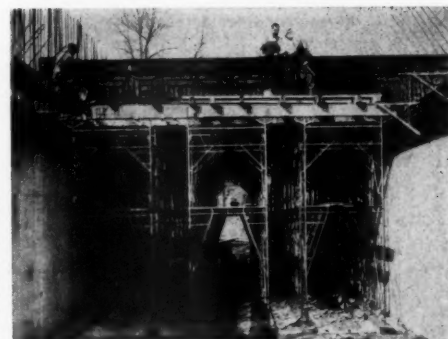
Gross combination weight rating for single-axle tractors is 65,000 pounds; for tandem axle models, 76,000 pounds.

The manganese-alloy frame is lightened through use of aluminum cross members, and the front bumper, hood, battery box, and other parts are made entirely of aluminum. A Hopkins muffler and rod-actuated emergency brake are said to save additional pounds, as do special high-strength,

CONTRACTORS AND ENGINEERS



Lightweight design and heavy-duty service capacity are incorporated in the Diamond T new diesel-powered Model 922 truck tractor.



Case history: By using Trouble Saver steel shoring in the erection of a new bridge in Scotch Plains, N. J., the Mal-Bros. Construction Co. reports a 25 per cent saving on its labor costs. A total of 272 5-foot-wide frames were used; assembled in 3x5-foot towers spaced one foot apart, with two and a half feet between rows, they provided ample support for formwork on the new bridge. For further information on the Trouble Saver shoring, write to The Patent Scaffolding Co., Inc., Dept. C&E, 38-21 Twelfth St., Long Island City 1, N. Y. Circle No. 152.

lightweight fuel tank supports.

Three Cummins diesel engines are available for the Model 922: the NHB-600, which develops 210 brake horsepower; the HRFB-600, which develops 210 brake horsepower; and the turbo-supercharged NTO-600, which develops 262 horsepower.

A choice of two front-axle positions to provide the most favorable weight distribution to comply with various legal restrictions is offered.

The Diamond T "Full Vision" steel safety cab is standard on the new Model 922. The cab is a full 69 inches in width, with double-wall construction of heavy gage steel, die-formed and welded. There is no obstructive center post in the windshield to interfere with the driver's vision.

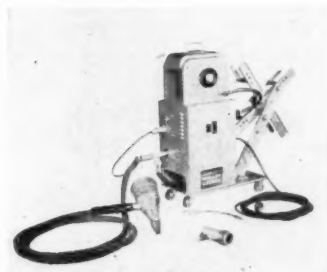
Diamond T Motor Car Co., Dept. C&E, 4401 W. 26 St., Chicago 23, Ill.

Circle No. 53.

Semiautomatic welder in lightweight model

A new semiautomatic submerged arc welding unit of compact and lightweight design has just been announced by Hobart Bros. Co.

The new unit is completely equipped with all controls and control power cable for plugging in on 110 volts (either dc or ac), wire reel, caster-mounted base, and carrying handles. A gun cable assembly is included with two welding guns which are interchangeable—one flux type with hopper and one open-arc type for welding



without flux.

This unit is designed for use with any arc welder having continuous current up to 500 amp using 5/64 or 3/32-inch solid wires, and tubular 3/32 or 7/64-inch fabricated wires.

Hobart Bros. Co., Dept. C&E, Hobart Square, Troy, Ohio.

Circle No. 166.



The only calculator that brings Automation to Estimating

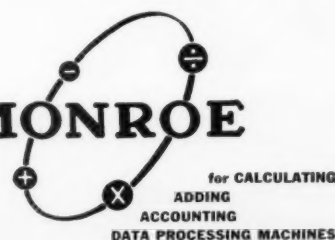
ONLY MONROE CAN MULTIPLY WIDTH X LENGTH X DEPTH IN ONE CONTINUOUS ERRORLESS OPERATION!

When turning take-off specifications into dollars and cents estimates, both speed and accuracy are vital. This Monroe Calculator with its exclusive ability to multiply three or more factors together in one continuous work-saving operation shortcuts literally hundreds of figuring steps in construction estimating. Volume problems such as cuts and fills and cubic yards of material are naturals for this machine. Monroe's ability to hold a constant multiplier also speeds the work of determining angle areas. Thanks to these and many other automatic features, Monroe Calculators save you time and money on every figuring job from simple payroll to complex coordinates problems.

If your business depends on estimating speed and accuracy, it will pay you to investigate Figurework Automation with a Monroe Calculator.

Locate the nearest Man from Monroe in the yellow pages of your telephone directory. Monroe Calculating Machine Co., Inc. General Offices: Orange, N. J. Offices throughout the world.

See the MAN from MONROE



For more facts, use Request Card at page 18 and circle No. 459

Product Parade

The Barber-Greene Model 702 ditcher can now be furnished with twin castors as an optional feature.

Twin castors optional on small ditcher

Originally developed for customers having special problems of ditching in cramped, urban areas, Barber-Greene's twin castor wheel assembly for the Model 702 ditcher will now be offered as optional on all machines of this type.

Usually, the Model 702 is equipped with a single, centrally located castor, adequate for virtually every application. In some types of urban service



work, however, the twin castor with two wheels mounted 24 inches apart has advantages. For example, when laying service lines across paved streets, it is sometimes the practice to break out the pavement ahead of the ditcher to reduce wear on the digging boom. Since the trench is dug through this broken out area, the single castor wheel would also have to run through this rough path; the twin castor wheels, however, readily "straddle" the area. Faster digging and more accurate control of grade and direction is said to result.

The new twin castor assembly can be installed on any Model 702 now in the field with not more than four hours' labor involved, according to the manufacturer.

Barber-Greene Co., Dept. C&E, 400 No. Highland Ave., Aurora, Ill.

Circle No. 38.

Tandem dump trailer employs hydraulic lift

Extra lifting power of hydraulics has been combined with work-proved "earthworm" dump action and low dead weight design in the Clement 2715-TLH hydraulic-lift tandem dump trailer manufactured by Clement-Braswell, Inc.

This Clement trailer has been structurally designed to eliminate heavy, rigid frames and to carry bigger legal payloads, according to the manufacturer. Suited to heavy service on round-the-clock operations, the unit is said to dump capacity loads of gravel, aggregate, and all types of bulk material fast, smoothly, and with less wear and tear on operator and equipment.

Utilizing the "earthworm" dump action principle first developed by Clement for its original cable-lift design, the hydraulic-lift trailer employs the

Let the men who make 'em—fix 'em

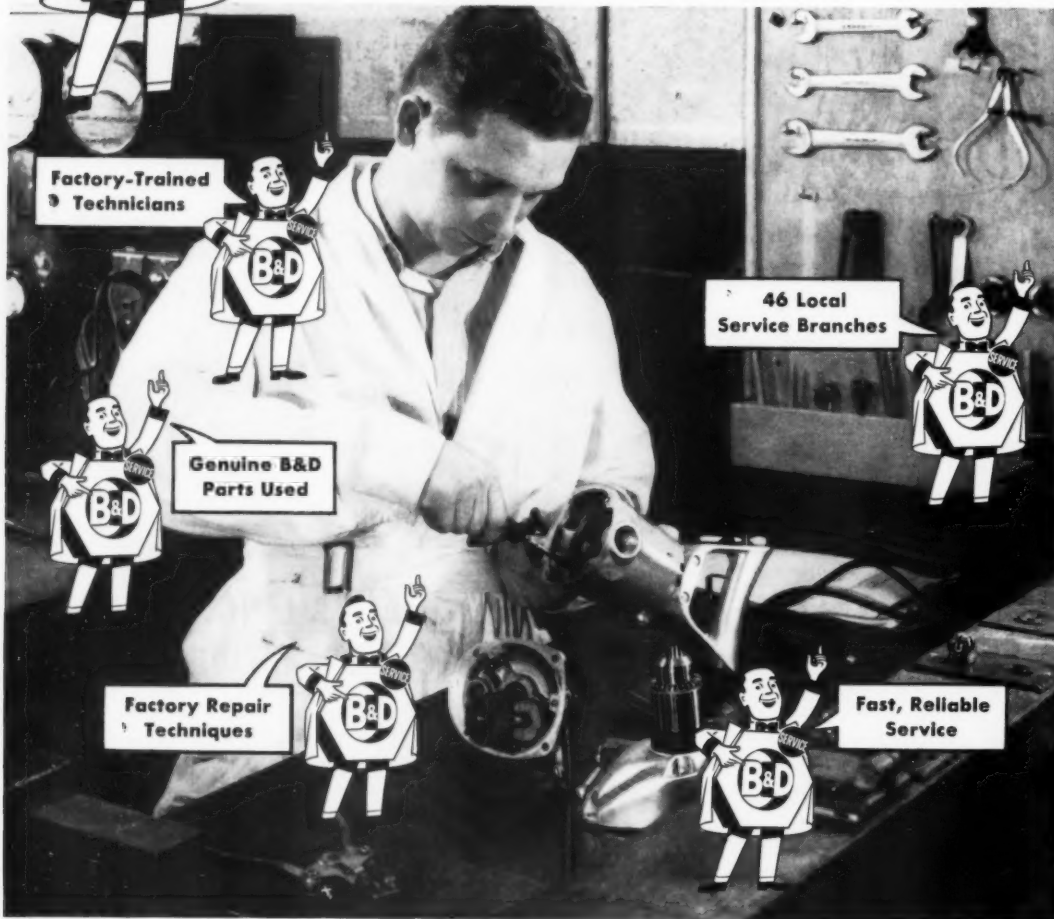


Swiftly Service says: "Local Black & Decker Factory Service Branches keep B&D Tools in new tool shape."

Your Black & Decker Factory Service Branch was set up to give you the fast, expert help we pledged when you first chose Black & Decker. Take advantage of the quick, economical service available near you—no need to return your tool to the factory. If you have a tool that's limping along, get it back on the job faster by

bringing it in to any one of our 46 Service Branches. Won't cost you a cent to let our factory-trained technicians look it over.

Look in the Yellow Pages of your telephone book for the Black & Decker Service Branch nearest you, or write us for address: THE BLACK & DECKER MFG. CO., Dept. S3606, Towson 4, Maryland.



Factory-Trained Technicians

46 Local Service Branches

Genuine B&D Parts Used

Factory Repair Techniques

Fast, Reliable Service

FREE Tool Inspection: Your local Service Branch will be happy to examine your B&D Tool with absolutely no obligation on your part.

B&D Standard Guarantee applies to all repair work.



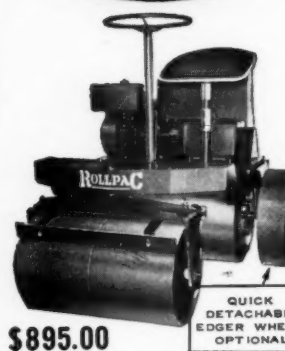
Look in the "Yellow Pages" for your nearest Factory Service Branch



Black & Decker

PORTABLE ELECTRIC TOOLS

For more facts, use Request Card at page 18 and circle No. 460



\$895.00

A Standout One Ton Roller in worldwide use by Contractors, Paving Engineers and Institutions.

Ask To See It.

ROLCOR Industries
1208 2nd Ave. So. Minneapolis 3, Minn.

For more facts, circle No. 461

CONTRACTORS AND ENGINEERS



This Clement Model 2715-TLH tandem dump trailer is available in 10 to 24-cubic-yard sizes.

added lifting power of hydraulics. High maneuverability permits it to angle-dump even when jackknifed to a 90-degree angle, work on hilly or rough terrain, batch dump, or spread evenly and smoothly.

From the cab-mounted controls, the operator has complete control of the dumping operation. The load may be raised, held stationary, dumped, and lowered without his leaving the cab. When the trailer brakes are locked and the lifting rams extended, the tractor is drawn backwards as the trailer body raises, dumping the load at any selected spot. For area dumping, the tractor brakes are locked and the trailer wheels are drawn forward as the lifting rams are extended. For spread dumping, the driver extends the lifting rams as the unit moves along the dump area. When the trailer bed is raised to dumping position, the tailgate latch automatically releases, then locks itself again as the bed is lowered.

Quickly adapted to any standard tractor or truck, the Clement hydraulic-lift trailer may be obtained in sizes from 10 to 24 yards, single or tandem models.

Clement-Braswell, Dept. C&E, Louisiana Bank Bldg., Shreveport, La.

Circle No. 52.

Fuel system pares costs, extends engine life

All heavy-duty International trucks, in four, six, and all-wheel drive, conventional and cab-over-engine design, are now offered with LPG systems for the firm's 6-cylinder and V-8 engines, the International Harvester Co. announces.

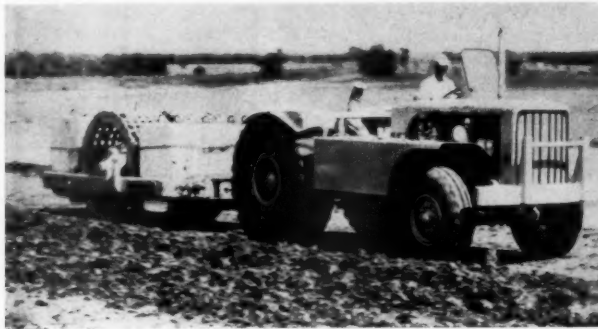
Reduced maintenance costs and a longer operating life are among the features stressed. Especially important in smog areas, the company suggests, is the elimination of exhaust smoke and fumes in an LPG engine.

Horsepower and torque characteristics of the V-8 LPG engine are said to be virtually the same as those of the gasoline version.

International Harvester Co., Motor Truck Division, Dept. C&E, 180 N. Michigan Ave., Chicago 1, Ill.

Circle No. 202.

Case history: A contractor on a stretch of the Kansas Turnpike used a Hyster grid roller to achieve high-speed compaction of a 29-foot-high structural approach for a railroad overpass. Over 10,000 cubic yards of material was spread in 8-inch lifts per 11-hour shift. A water-ballasted tractor towed the roller. Densities of 104 to 108 per cent were obtained in 12 passes taking only 23 minutes on a 1,200-foot section 12 feet wide. Hyster Co., Dept. C&E, 2902 N. E. Clackamas Street, Portland 8, Oreg. **Circle No. 69.**



McMahans Construction Co.'s "660" shapes bank on edge of fill built-up by scrapers, works in third gear (4.7 mph). In addition to standard 12' x 28" blade, this Rochester, Indiana, company has equipped its Adams grader with scarifier, for opening-up hard materials, old roadways, and rocky soil. Power-steer is standard equipment.

Big ALL-JOB grader

extra power for heavy-duty grade work

Here's a BIG grader with work-capacity to match . . . a machine that handles all grade work at lowest cost. It's the 150 hp Adams 660 . . . a 30,200 lb. machine geared to fast, modern work methods.

15 speeds boost output

Adams 660 really makes the dirt "fly", with more power-speed combinations than any other conventional transmission grader. For your normal work-range, "660" gives you 4 full-power forward speeds (2.3 to 6.7 mph) instead of 3. It provides 2 reverse-work speeds as against the usual 1. You get "just-right" power and speed for all every-day blading operations.

Three optional *creeper speeds*, as slow as 36 feet per minute, provide extra "muscle" for rugged work . . . controlled power for precise blading and work in rocky soil.

Add to this *high travel speeds* (forward and reverse) that cut-down wasted time . . . add profitable minutes for revenue-producing work. 4 forward gears (10.3 to 26.0 mph) speed maneuvering, make hill climbing easier, cut travel time. And "660's" 2 faster reverse speeds (to 13.7 mph) save many turn-arounds . . . give up to 30% bonus production on one-way work.

Positive controls speed blading

Your operator works faster, more precisely with smooth Adams blade controls. Three-jaw clutches engage without chatter or kick-back. Direct-drive power is applied steadily. Your operator can depend on blade operation at constant speed — no matter how many other controls are actuated. There's no vibration because all clutches, gears, shafts, and universal-joints move on anti-friction bearings.

Attachments widen work-range

There are a number of profitable attachments you may want to add to the "660" . . . now or later: *Scarifier* for opening-up clay, rock-filled soil, or old roadways . . . *push-plate* for push-loading scrapers, or starting stubborn equipment . . . *bulldozer blade* for odd-lot casting and back-filling . . . *Ele-grader* for stripping topsoil, loading dirt, casting ditch-material, building up roads . . . *snow equipment* for winter snow removal work.

Also, 190 hp "660" with torque converter

For maximum push-power at all speeds between 0.0 and 27.4 mph, LeTourneau-Westinghouse offers the new POWER-Flow 660. This super heavy-duty grader applies 190 hp thru torque converter to give you the effective work-power of an infinite number of

power-speed combinations. POWER-Flow 660 plows thru varying loads at constant speed . . . will not stall . . . starts extra-heavy loads without lugging. Torque converter cushions engine and drive against shock . . . makes operation simpler, more efficient.

Ask for a demonstration

Call or write, and ask us to show you how Adams graders — all 6 sizes, 60 to 190 hp — work faster, cut deeper, blade truer, put-out more finished work than any other grader of similar size and power. In the 190, 150, 123, 104 and 80 hp sizes, you have a choice of GM or Cummins diesel engines.

With special moldboard-attached blade, another Adams grader owned by McMahan Construction Co. cuts precise sub-grade along Indiana Route 49. McMahan added 4' width to each side of pavement along 8.8 miles between Valparaiso and Chesterton, Indiana.



Adams, POWER-Flow—Trademark AG-1223-M-b-6



LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

Where Quality is a Habit

For more facts, use Request Card at page 18 and circle No. 462



The Sherman Model F power digger mounted on a Ford tractor equipped with a front-end loader is demonstrated at press preview in Chicago.

New hydraulic digger has speed, durability

A new power digger for mounting on Ford tractors was introduced by Sherman Products, Inc., at a press demonstration last month in Chicago.

The hydraulically controlled backhoe unit features fast digging and long life, according to the manufacturer. One of the factors contributing to the speed of the unit is the exceptional power, which provides a break-away capacity of 9,000 pounds. Contributing to this power and speed is a new compact hydraulic system which has an operating pressure of 2,000 psi.

The Sherman Model F power digger can excavate a trench 15 feet 8 inches long from just one tractor position. The arc of swing is 188 degrees, the reach below grade is 12 feet, and the loading height is 9 feet 2 inches.

The hydraulic stabilizers, which are individually controlled, have a spread of 8 feet and give both lateral and angular support. They fold to less than tractor width for transporting.

Main and swing frames are of steel plate weldment construction and the reinforced, box-construction boom permits heavy-duty operation. The crowd cylinder operates within this boom for protection when loading or digging.

Sherman Products, Inc., Dept. C&E, Royal Oak, Mich.

Circle No. 264.

New 250-watt base unit for mobile radio setup

The addition to its mobile radio product line of a newly designed 250-watt base station for operation on the 25 to 54 megacycle frequency range has been announced by Bendix Radio.

The new station is housed in a 6-foot steel cabinet with front and rear access doors. Unitized plug-in chassis construction is featured and provides for the addition of a second receiver, local or remote control, and Quiet-Line tone squelch. All operating and tuning adjustments are accessible from the front. A built-in metering panel provides constant visual monitoring of the station in operation.

Mobile Products Dept., Bendix Division, Bendix Aviation Corp., Dept. C&E, Joppa Road, Baltimore 4, Md.

Circle No. 207.

Easily installed link for hoist and drag chain

An easy-to-install "missing link" for repairing hoist and drag chains has been developed by Kensington Steel Co.

The manufacturer calls attention to the simplicity of the link and the ease with which it can be assembled. It consists of two identical half links and a combination key and wedge. The half links are inserted through the ends of the chain to be joined; then when the edge is driven into place, it automatically bends the key



and thus locks the link together. No welding, burning, or riveting is needed.

Kensington repair links are cast of

Earthmovers do double-duty

...relocate 5½ tortuous miles of U.S. 2, near "Continental Divide"



Tournapull® scrapers change river channels

--convert to Rear-Dumps to outmaneuver trucks 5 loads to 4, hauling blast-rock

Completion of a million yards of tough earthmoving by Tony Marrazzo Construction Co., Boise, Idaho, has ended a motorists' nightmare east of Nyack, Montana, along the most dangerous 5 miles in the entire cross-country length of U.S. 2. Road hazard was so bad, that even before surfacing, traffic started using a new route to bypass hairpin turns in the old mountainside road.

Construction of a river-level road along Middle Fork, Flathead River, boundary of Glacier National Park — involved moving 1,000,000 cu. yds. of dirt and rock. To handle 75% of the yardage, Marrazzo used three 16-yd., 210 hp, self-propelled C Tournapull-Scrapers — plus 21 interchangeable, 22-ton rear-dump trail-units. Machines were equipped with Electrotarders — an auxiliary braking system which eliminates brake wear and provided added safety on long, steep grades.

Scraper trail-units used first

C Tournapull-scrappers dug out new channels to straighten 3 curves in the mountain river. To do this, the waded out thru water with full load, working in the river bed without difficulty. Scraper units also handled other dirtmoving assignments along the job...built grade along the river...and cut off a sharp curve to relocate 1600' of G.N.R.R. track.

Convert 'Pulls to Rear-Dumps Haul blast-rock to "Devil's Elbow"

In one 3000' section of road, contractor had to drill, blast, and excavate 195,000 cu. yds. of rock. For hauling, contractor converted "C's" to Rear-Dumps by a simple change of trail-units. The two 22-ton "Pulls and 2 similar-sized conventional competitive dump trucks hauled and dumped rock in a deep valley...built a fill for the road way, 125' high, over an 8½' x 4½' culvert. The new highway cut

C Tournapull Rear-Dump rolls onto narrow track and pivots around for quick back-up to dump edge. For only about 25% extra outlay, Tony Marrazzo Construction Co., Boise, Idaho, bought interchangeable dump trail-units for their "C" scrapers. Scrapers loaded, hauled and spread dirt; Rear-Dumps hauled and loaded rock, near Nyack, Montana.

Supermang, a high-manganese alloyed steel specially developed for its extra strength and ability to resist wear. According to the manufacturer, it is as strong or stronger than other links in the chain since the parts are cast rather than welded together.

Available in sizes from 1 to 3 inches, Kensington repair links will fit all standard cast-manganese drag and hoist chains.

Kensington Steel Co., Dept. C&E, 505 Kensington Ave., Chicago 28, Ill.

Circle No. 142.



The Papec No. 92 highway mulcher has a capacity of from 5 to 10 tons per hour.

New highway mulcher features adhesive pump

A new highway mulcher has been introduced by Papec Machine Co. According to the company, the No. 92 mulcher with a four-man crew will do in one hour the work usually done by nine men in 8 hours.

The delivery pipe on the new unit features a positive control enabling the operator to swing it 270 degrees horizontally and 40 degrees up from the horizontal. The entire assembly is mounted on ball bearings.

Another new feature is an adhesive pump, available as special equipment. The increasing practice of applying an adhesive to the mulch to prevent it from blowing away has made the need for such a device very obvious, the manufacturer states. The gear-type pump, driven by a roller chain from the main shaft, draws the adhesive from a drum mounted on the front of the mulcher and forces it through a hose which discharges it into the stream of chopped material near the outlet of the delivery pipe. The air stream causes the adhesive to effectively coat the particles of chopped material as they are blown onto the new seeding.

The Papec mulcher is driven by a 52-hp water-cooled engine. The machine can be set for several lengths of cut. The mulcher is mounted on 7.50 x 24 6-ply tires and weighs approximately 3,376 pounds. Capacity is from 5 to 10 tons per hour.

Papec Machine Co., Dept. C&E, 30 W. Main St., Shortsville, N. Y.

Circle No. 180.

	Competitive Dump-trucks	Tournapull Rear-Dumps	"C's" saved
LOAD, 5-2½ yd. dipperfuls	1.97	1.91	0.06
MANEUVER, at shovel	0.84	0.52	0.32
HAUL, 1470' down and up grades to 18% ..	3.04	2.36	0.68
MANEUVER, at fill	1.22	0.46	0.76
DUMP	0.28	0.21	0.07
RETURN, 1470'	2.62	2.51	0.11
TOTAL CYCLE, average	9.97	7.97	2.00



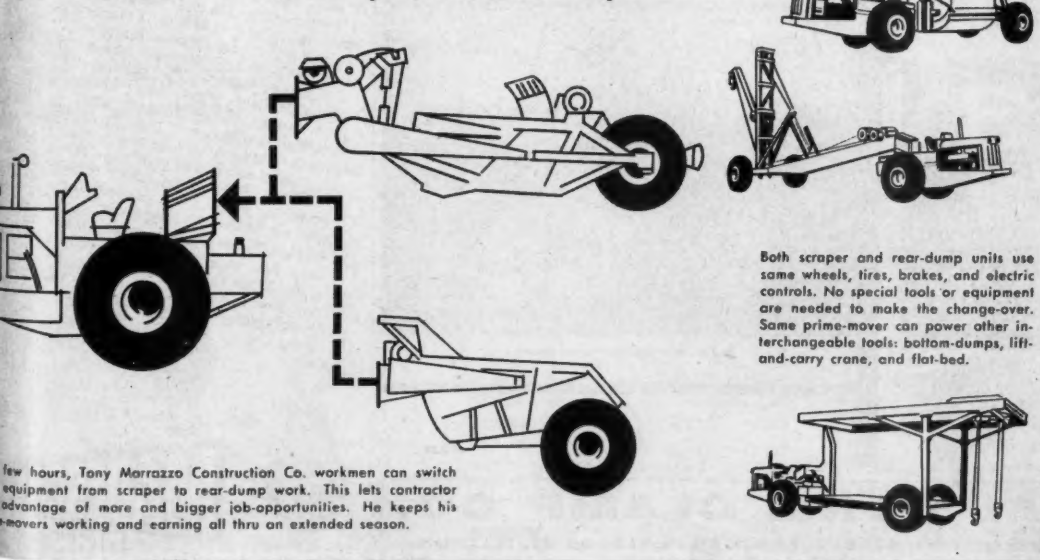
On this narrow ledge, 2 of Marrazzo's C Rear-Dumps and 2 competitive dump trucks were each loaded with five 2½-yd. buckets of blast-rock. Restrictive terrain temporarily made it necessary for loaded haulers to back up to 40' wide turn-around before starting haul.



Hauling thru cuts previously carved-out, loaded Tournapulls attained speeds to nearly 30 mph, averaged 7.08 mph from start to stop on 1470' trip to the fill. Haul road presented a continuous succession of grades varying from 18% favorable to 10% unfavorable on the haul.

CPCR-1206-H

Simple conversion from scraper to rear-dump



Both scraper and rear-dump units use same wheels, tires, brakes, and electric controls. No special tools or equipment are needed to make the change-over. Same prime-mover can power other interchangeable tools: bottom-dumps, lift-and-carry crane, and flat-bed.

LeTourneau-WESTINGHOUSE Company
Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company
Where Quality is a Habit

For more facts, use Request Card at page 18 and circle No. 463

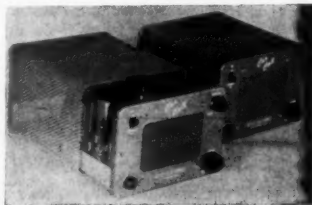
New FM receiver unit for mobile radio setups

Seeley Electronics has announced a new FM model of its Car Call mobile receiver. This new model F Car Call receiver is said to be ideal for use on an auxiliary mobile receiver in conjunction with two-way mobile services in the 30 to 50-megacycle band, used on large construction jobs.

The new receiver is a highly sensitive, crystal-controlled, fixed-frequency mobile unit which will operate on either 6 or 12 volts. An effective squelch circuit, adjustable from the front panel, is included for complete quieting of the receiver between calls.

Seeley Electronics, Dept. C&E, 1060 South La Brea Ave., Los Angeles 19, Calif.

Circle No. 58.



This new FM mobile receiver is offered by Seeley Electronics as an auxiliary unit for two-way radio setups.



The Meckum Sand Master is now available in portable models like this 72-inch unit with heavy rear axle and coupling equipment.

Portable sand drags in range of sizes

Through design changes and modifications, the standard Meckum Sand Masters have been beefed up and fitted with a rear axle and front pin arrangement to solve the need for portability. The machines, long on the market as permanent installations, are used primarily for the dewatering of fine sand.

The contents and specifications of the portable models are the same as those of the standard units except for an increase in weight in some models,

according to the manufacturer.

Meckum Sand Masters are available in widths to 72 inches and with capacities to 150 tons per hour in the improved and redesigned models. The portable units are available completely assembled and are said to be easily hauled by any standard truck tractor.

Meckum Engineering, Inc., Dept. C&E, Dayton Road, Ottawa, Ill.

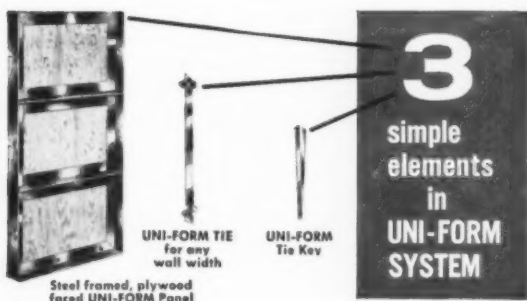
Circle No. 189.

reduce forming costs...

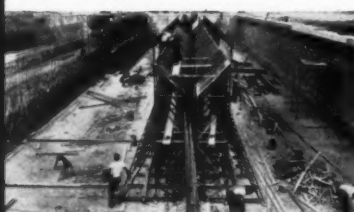


Whether you're bidding on a sewage treatment plant, industrial building, highway bridges, overpasses or abutments, heavy foundations, circular tanks or a warehouse, UNI-FORM Panels will give you the lowest all around forming costs.

Why? UNI-FORM Panels can be erected faster, using less labor and material because the three basic elements of the UNI-FORM System—Panel, Tie and Tie Key provide simple mechanical assembly into any type of form. Unique system of attaching the minimum aligning lumber required reduces labor by 50% . . . pre-engineered techniques for handling pilasters, corners, stepped footings, columns, battered walls assure fast job progress.



INTERESTED? Get the catalog and complete details on the UNI-FORM System today. Send us a set of plans for our recommendations. You will be money ahead, and there's no obligation.



Sewage Treatment Plant "Y" Walls



Slabs



Circular Walls



Heavy Industrial Foundations

Lightweight hand level is easily adjusted

A hand level with a cross hair that can be adjusted from the outside with an ordinary pocket knife is available from the Stratex Instrument Co., Inc.

The instrument is fitted with a non-metallic eyepiece tube bearing designed to eliminate potential wear from metal-to-metal contact in the draw tube bearing. Made of aluminum, the instrument is finished in jet synthetic corundum to preclude paint flaking.

Stratex Instrument Co., Inc., Dept. C&E, 3515 Sunset Blvd., Los Angeles 26, Calif.

Circle No. 197.

Car shaker facilitates unloading of material

A new car shaker, designed to expedite the unloading of sand, gravel, and other construction materials from hopper-bottom and open-top railroad cars, has been announced by Eastern

FOR SAFE AND SPEEDY HOISTING

Heavy construction calls for heavy-duty blocks and MADESCO blocks combine the performance features developed through 30 years of specialized engineering for the construction field. Heavy steel shells and fittings, heavy iron or steel graphite-bronze, self lubricating sheaves are grooved to give you the maximum return for your rope investment. Sheaves equipped with bronze or anti-friction bearings for easy operation and long service. Our special service departments will help you with their recommendations. Write for our catalog or consult your equipment dealer who can supply you with MADESCO products.



For more facts, circle No. 465

CONTRACTORS AND ENGINEERS



UNIVERSAL FORM CLAMP CO.

GENERAL OFFICES AND FACTORY: 1238 N. KOSTNER • CHICAGO 51, ILLINOIS

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SAN LEANDRO, CAL. 2001 1/2 Williams Street	LOS ANGELES, CAL. 3810 S. Figueroa St.	HOUSTON, TEX. 2314 Preston Ave.	CLEVELAND, OHIO 2801 Lakeland Blvd.	BALTIMORE, MD. 1020 N. Kresson St.	ATLANTA, GEORGIA 1401 Howell Mill Rd., N.W.
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UNIVERSAL FORM CLAMP CO. OF CANADA, LTD. • 226 Norseman Street • Toronto, Ontario

DISTRIBUTORS IN PRINCIPAL CITIES

For more facts, use Request Card at page 18 and circle No. 464



The Eastern car shaker is said to assure fast flow of materials from a railroad car.

Constructors, Inc.

The Eastern car shaker reportedly combines the impact features found in car shakers which operate on the top edges of the car with the vibration features found in car shakers which hang on the car side and are clamped to the under-frame of the car. It is said to be particularly effective in loosening stubborn or frozen materials and starting a rapid flow from hopper openings.

The action of the shaker is produced by rotating an unbalanced shaft at 1,800 rpm. The shaft is fitted in two heavy-duty self-aligning bearings carried in bearing housings which fit snugly in two heavy side plates. The side plates rest on the upper edge of the car when the shaker is in its operating position. The eccentric action of the rotating shaft is carried directly to the car without going through any welded connections.

The unbalanced shaft is driven by a 10-hp totally-enclosed motor mounted on a spring-supported base.

Eastern Construction, Inc., Dept. C&E, Poland, Ohio.

Circle No. 192.

LP gas burner gives quick, clean heat

Designed for use with tar kettles, asphalt trucks, and on any other applications where an abundance of quick, clean heat is required, the new Wemco Model TK-2 burner operates on LP gas and is reported to deliver over 500,000 Btu per hour. It can also be operated on vapor LP gas.

The TK-2 burner is also available as a unit with fully automatic controls.

Wemco Products, Dept. C&E, 1031 E. Ten Mile Road, Royal Oak, Mich.

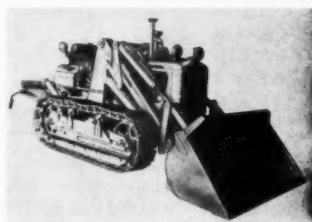
Circle No. 216

To obtain further information on any of the products described in this section, circle the number given at the end of the item on the handy Request Card that is bound in at page 18 of this issue.

New high-speed loader features low silhouette

Many major operating improvements are said to be featured in the new Oliver 1½-yard loader, designed specifically as a complete tractor-loader unit.

There is low-silhouette mounting with 20 per cent lower side pedestals than on former models. This low-profile design gives 360-degree clear



vision. The low center of gravity is said to result in unusual stability,

permitting quicker, fuller loading.

The heavy frame of the Model OC-126 is rigidly mounted for extra loader strength. Track frames are fixed stationary to the main frame. Full-length steel guards protect the five lower track wheels and track assembly by keeping out gravel.

The Oliver Corp., Dept. C&E, 400 W. Madison Street, Chicago 6, Ill.

Circle No. 42.



With high-apron lift and positive-ejection tailgate, electric control B Tournapull with Fullpak Scraper spreads heaping load fast in controlled layers.

BIG B FULLPAK* delivers more pay-yards... at lowest-net-cost-per-yard

The new LeTourneau-Westinghouse 27-yd. B Tournapull® with Fullpak Scraper has the capacity, speed, power, and stamina to deliver more pay-yards at lowest-net-cost-per-yard—lower than any of today's big production scraper units. The big "B" incorporates the same high-production design test-proven by its popular companion, the 18-yd. C Tournapull. Check these important B Tournapull advantages:

✓ **Loads faster** — Dirt flow into new B Fullpak bowl is nearly horizontal, since bowl bottom has only 1° rise. Giant scraper packs full capacity, low-void payloads fast. With shallower, broader bowl, less force is required for lifting material to heap bowl—as with boxy high-sheeted scrapers. That means more power can be applied to cutting and pulling. Also, low push-block speeds load by giving direct-line thrust from pusher to blade.

✓ **Boils better** — B Fullpak tailgate has curved top, to roll material forward into the heap—filling all corners and around apron. Crowned side-sheets reduce spillage, help deflect material into all corners.

✓ **High apron lift** — 7'1" apron lift speeds loading and unloading of chunky material. Smooth streamlined side-arms and side-sheets prevent chunks from being trapped.

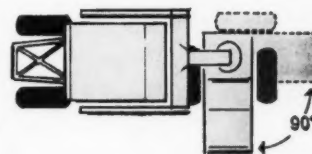
✓ **10 speeds** — Choice of 10 speeds forward (from 2.6 to 28.4 mph) ... plus clutch brake for fast shifting ... means hauling at higher speeds, more trips per hour. Low-gear matches pusher speed, enables 293 hp "B" to help itself in loading, gives maximum power for pulling through soft footing.

✓ **Faster, easier servicing** — All working parts of B Fullpak are easy to get at and service in the field. Fewer fittings and check points reduce lubrication time. Big 27.00x33 low-pressure tires have ample load-carrying capacity, are interchangeable all around.

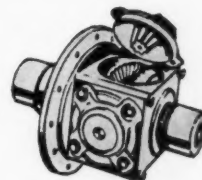
For complete details

These and other exclusive LeTourneau-Westinghouse features give you high-efficiency on your production earth-moving for big construction jobs. No other big-capacity scraper can match Fullpak's combination of advantages. Call or write for complete details.

Other profit-producing features on the new B Tournapull



90° turns ... with electric power-steer, through geared king-pin, permit Big "B" to make non-stop U-turns in area less than its own length ... less than the turning diameter of a pick-up truck.



Power-transfer differential ... automatically transfers power from slipping wheel to wheel with best footing. With Tournapull you travel safely through soft, spongy spots with smooth, even application of power to tractive conditions.



Exclusive Fullpak Scraper design ... gives faster loading, better bailing. Diagram shows how lower push-block carries pusher thrust direct to blade for fast cut.

*Trademark BP-1404-G-b



LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company
Where Quality is a Habit

For more facts, use Request Card at page 18 and circle No. 466



The Blaw-Knox 3/4-cubic-yard pneumatic-closing-type clamshell bucket, shown in a shaft-mucking operation, is capable of loading as much as 210 cubic yards of rock in an 8-hour day.

New clamshell bucket is air-operated unit

A new air-operated clamshell bucket is among the recent developments by the Blaw-Knox Co.

The air-operated clamshell was designed for use with single-drum hoists to speed shaft mucking and excavating. According to the company, safety has been a major factor in designing the bucket. All external edges are streamlined and the bucket is well balanced. Both the 3/4 and 1-cubic-yard sizes are designed to accommodate either Ingersoll-Rand or Gardner-Denver air hoists.

Weight of the 3/4-cubic-yard bucket is 2,670 pounds, including the 490-

pound air hoists. Equipped with the Ingersoll-Rand air hoist with 7-inch drum and overhead control, at 80 psi air pressure and 124 fpm, a closing force or lift of 2,000 pounds is exerted. The 3/4-cubic-yard bucket stalls at 3,200 pounds line pull and the 1-cubic-yard bucket stalls at 4,000 pounds line pull.

In a field application, the 3/4-cubic-yard clamshell loaded as much as 210 cubic yards in an 8-hour day.

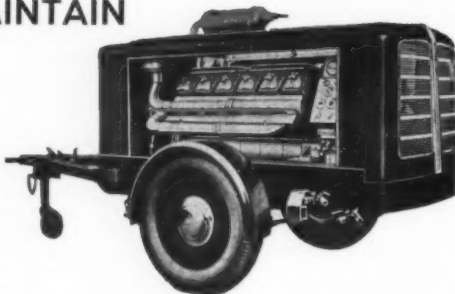
Blaw-Knox Co., Dept. C&E, 300 Sixth Ave., Pittsburgh 22, Pa.

Circle No. 44.

MODERN AIR-COOLED COMPRESSORS

COST LESS TO BUY, OPERATE AND MAINTAIN

AVAILABLE IN
5 PORTABLE
MODELS OF
55 TO 320 CFM
CAPACITY



Famous IHMER & ELZE air-cooled diesel-driven compressors, imported from West Germany, deliver more compressed air per pound of fuel than comparable liquid-cooled units. The compressor you need for a given air capacity weighs less and costs less when it's an air-cooled I&E.

The many unusual mechanical features of I&E compressors mean not only economy, but trouble-free performance. There is, of course, no coolant to freeze. Electric starting by battery does away with

secondary fuels, spark plugs, distributors. A Bosch inclined-type pump supplies fuel; any type of reasonably low viscosity will do.

Compressor and drive units are integral, working on the same motor block and crankshaft, and lubricated in a common crankcase. Compressing parts are fewer and a great proportion are identical on all models, requiring fewer spares. A patented valve design has consistently resulted in efficient valve life of more than three years without servicing.

AIR COMPRESSORS INC.

2339 WEST BEAVER ST.

P.O. BOX 2976

JACKSONVILLE, FLA.

For more facts, use Request Card at page 18 and circle No. 468

Permanently lubricated bottom track roller

A new bottom-track tractor roller containing tapered roller bearings plus a permanently sealed-in lubricant has been developed by the Hensley Equipment Co.

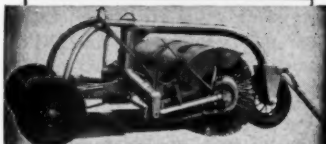
The new part, known as the Hensley Nev-A-Lube roller, is packed at the factory with a special roller bearing lubricant, and then sealed. Once installed, the Nev-A-Lube roller is said to require no further lubrication, and is reported to save the time and labor cost normally associated with roller greasing operations. In addition, it is said to reduce friction considerably and conserve horsepower.

The Nev-A-Lube roller is built specifically for use on most Caterpillar, Allis-Chalmers, and International Harvester tractors, and on the Oliver DG and DD tractors.

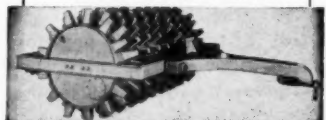
Hensley Equipment Co., Inc., Dept. C&E, 800 Peralta Ave., San Leandro, Calif.

Circle No. 170.

Grace ASPHALT AND COMPACTION EQUIPMENT



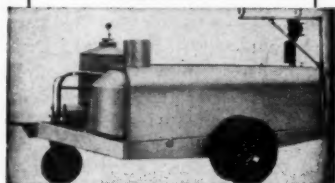
Roadsweepers, traction, engine-driven or tractor-mounted



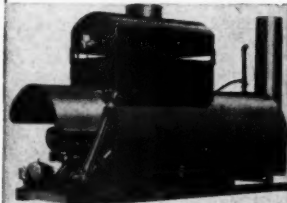
Sheepfoot rollers



Chip spreaders



Circulating asphalt heaters



Automatic oil heaters for hot plants



Pneumatic rollers, self-propelled or trailed

W. E. GRACE MFG. CO.

6003 S. Lamar • Dallas, Texas

For more facts, circle No. 467

CONTRACTORS AND ENGINEERS

ARPS TRENCH HOG

digs
DEEPER
WIDER
FASTER



Deeper Trenches—Depths up to 7' accurately controlled by hydraulic power.

Wider Trenches—6" through 20" widths; cutters changed easily for various widths.

Faster Trenching—Up to 800' per hour depending upon depth and soil conditions.

PLUS—

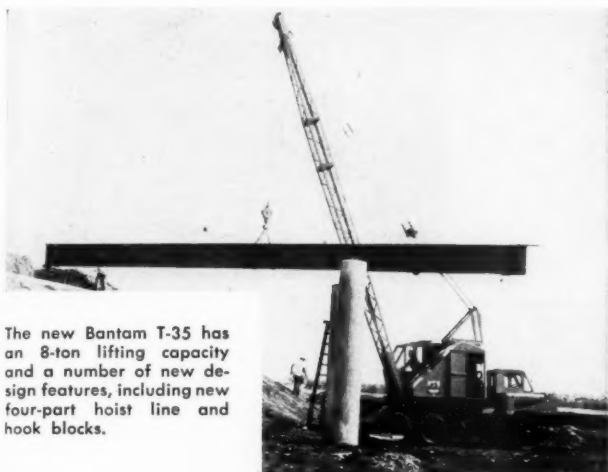
Heavier weight than any other tractor-mounted trencher assures greater stability, longer life and increased ability to handle tough soils. Independent speed control for each drive wheel provides extremely accurate straight-away and curved trenching. Special chisel-type cutters available for frozen or rocky soils. Sturdy, all-steel frame resists twisting . . . absorbs shock stresses. One-man operation and economy with wheel tractor mobility. Now available for most popular tractors, including light industrial models.

Ask for free literature and specifications. Write to Arps Corporation, New Holstein, Wis., Dept. CE.

ARPS CORPORATION
NEW HOLSTEIN, WIS.

TRENCHERS • HALF-TRACKS
BULLDOZERS • UTILITY BLADES

For more facts, use Request Card at page 18 and circle No. 469



The new Bantam T-35 has an 8-ton lifting capacity and a number of new design features, including new four-part hoist line and hook blocks.

Truck crane capacity boosted to 8 tons

Schild Bantam Co. has announced an increase to 8 tons' lifting capacity for its carrier-mounted T-35 crane.

The increased capacity is the result of extensive testing and modification of the former Bantam 7-ton model. The new Bantam T-35 basic, when mounted on the Bantam heavy-duty Model 300 crane carrier, will handle an 8-ton load in a 10-foot radius.

The following modifications have been incorporated into the heavy-duty Bantam: New four-part hoist line and hook block; eight-part boom-support harness; new open-throat box boom top section; 1,250 pounds of additional counterweight; hardened pins and bolts at highly stressed points in the boom and gantry assembly; double hook rollers; heavy A-frame legs and braces; high gantry.

Schild Bantam Co., Dept. C&E, Waverly, Iowa.

Circle No. 121.

Lightweight, adjustable aluminum safety hat

A new aluminum-alloy safety hat, ribbed for maximum blow resistance and with a headgear that is completely adjustable, is announced by The Boyer-Campbell Co.

The lightweight safety hat, called Superlite, is equipped with a polyeth-



ylene head suspension. The headband is marked in various sizes, in divisions, of $\frac{1}{8}$, for perfect fit.

The aluminum is said to repel heat in hot weather. Half-liners for cool and full liners for cold weather are available.

The Boyer-Campbell Co., Safety Division, Dept. C&E, 6540 St. Antoine, Detroit 2, Mich.

Circle No. 174.

Prefabricated, all-metal buildings fit many needs

An all-metal "standard building" that can be delivered to the job site within three weeks after an order is placed is announced by Republic Steel Corp.

Manufactured by the company's Truscon Division, the buildings are delivered with all siding, roofing, windows, doors, and hardware included. Truscon construction men and engineers handle erection.

Among the suggested uses of the building are as storage areas, offices, and maintenance shops.

The pre-engineered all-metal components come in standard sizes. Widths run 32, 36, 40, 44, or 48 feet,

with heights available in either 12 or 14 feet. Length is unlimited, since the building can be extended at either end as need demands. Rigid-frame design provides unobstructed head room for storage or machinery.

Economy, quick assembly, and clean appearance are achieved by ribbed galvanized panels for the roofing and siding. All windows and doors are available in a number of sizes, types, and locations.

Truscon Steel Division, Republic Steel Corp., Dept. C&E, Youngstown, Ohio.

Circle No. 194.

At Warner Co.'s Cedar Hollow Quarry Big AUTOCARS Keep the Crusher Working to Capacity

Warner Co.'s Cedar Hollow Quarry, near Phoenixville, Pa., supplies better than 550,000 tons of stone a year. It's a big operation calling for big hauling equipment. On the haul from quarry face to crusher, Warner uses three Autocar units. Two are Autocar 6-wheel gasoline tractors pulling 17-ton-capacity side dump semitrailers. The other is a Diesel 10-wheel truck, with a 17-ton side dump body, pulling a 17-ton full trailer with side dump body. As the grade is only 4%, Warner hooks this additional 17-ton load onto the Autocar truck, hauls double the payload with only one power plant and one driver. Loads of 100,000 lb. are commonplace, and the three rigs are sufficient to keep the crusher at Cedar Hollow working to capacity.

The haul from crusher to stockpile is steeper—about 12%. Here two single-axle Autocars of 15-ton capacity, one with a diesel engine, one with a gasoline, operate on a fast trip cycle. Since they replaced three 10-ton trucks, they are effecting a considerable saving on the operation.

Warner Co.'s daily cost records supply convincing evidence that the extra power and stamina built into every Autocar is an investment in hauling economy. Whether it's a double payload or a single one with a quick turnaround, Autocars perform with outstanding dependability. The Warner fleet, now 2 years old, has required no major overhaul, only routine maintenance. The quality is there, applied with custom engineering. Get in touch with your White-Autocar distributor and find out how these great trucks can make your operation more profitable.

AUTOCAR TRUCKS

Autocar Division,
The White Motor Company • Exton, Pa.



For more facts, use Request Card at page 18 and circle No. 470

Product Parade

Friction power take-off is remote-controlled

A new air-operated, remote-controlled friction power take-off is announced by the Twin Disc Co.

Available for use with engines up to 600-hp output in any application where a standard power take-off is used, this air-operated power take-off combines the Twin Disc Model PO air clutch (replacing a mechanically-actuated clutch) with the standard Twin Disc friction power take-off. Engagement and disengagement are accomplished by the turn of an air valve, rather than by a manually-operated handle.

The new unit is built to SAE standards. Present models are dimension-

ally identical to and completely interchangeable with the 18-inch, single and double-plate standard mechanically engaged power take-offs, and are furnished with SAE 0 and 00 flywheel housings.

Conversion kits are available for certain Twin Disc standard power take-off models already in the field. These include the Models B-118P, B-218P, B-124P, and EH-124P. The kit includes all items necessary for converting to the air-operated unit.

The Twin Disc Clutch Co., Dept. C&E, Racine, Wis.

Circle No. 214

This new 4-wheel-drive Chevrolet truck plows through hub-deep mud with power and traction to spare.



Line of twelve trucks with 4-wheel drive

Chevrolet is now in production of 12 models of 4-wheel-drive trucks said to meet the demands of specialized truck users by supplying the additional power and traction demanded by many off-highway operations.

The models include the Suburban Carryall; the 1/2, 3/4, and 1-ton pickup; 1-ton panel; and 3/4 and 1-ton stake truck models.

The "4x4's" reportedly are designed to meet specific needs of off-road operators where steep grades, deep mud and sand, and other conditions of terrain make operation of normal 2-wheel drive vehicles difficult or impossible.

Among suggested uses for the all-wheel drive units are as a motorized "packhorse" for surveyors, and as all-purpose delivery and odd-job units for roadbuilders and other contractors.

Ease of operation is said to be one of the outstanding features of the new vehicles. The power is supplied through a four-speed transmission, then "split" between the front and rear wheels through a two-speed transfer case. Front-wheel drive may be engaged or disengaged at any time without using the clutch, provided the transfer case is shifted into direct drive.

Chevrolet Motor Division, General Motors Corp., Dept. C&E, General Motors Bldg., Detroit 2, Mich.

Circle No. 167.

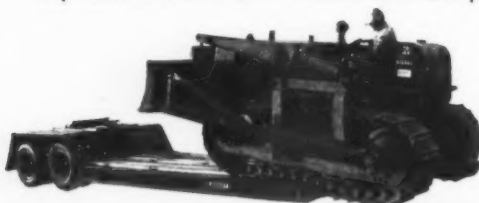
New Dorsey Removable Gooseneck Lowboy engineered for

One-man front-loading with EASE

"RG" Models
15 to 75 tons



Dorsey's new, patented hydraulic system brings new efficiency and speed to the field of front-loading trailers! Here, at last, is a unit that **one man** can really load or unload in **10 minutes**. You must see a demonstration of the "RG" to fully appreciate its many improvements over other makes. Here are just two of many new features:



- Very low loading and hauling heights, even with 20" wheels and full spring tandems (for high speed operation).
- Deck can be raised or lowered while loaded and in transit, to pass over or under obstructions.

For every tough job, there's a tougher Dorsey



ELBA / ALABAMA

Ask your Dorsey Distributor for the full story on this newest and most advanced of low bed trailers! For more facts, use coupon, or Request Card at page 18 and circle No. 471

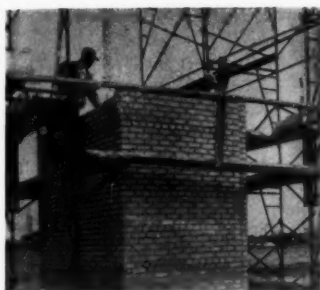
Climbing brackets speed raising of work platform

A new climbing bracket designed to improve efficiency and working comfort for masons has been introduced by the Waco Mfg. Co.

The climbing brackets can be adjusted for work at any height. The unit consists of a 24-inch-wide platform and a waist-high, 21-inch-wide material platform. The material and working platform can be raised by merely jacking the winch hoist. There is no need to remove planks or materials, the firm reports.

The bracket clamps around the leg of the scaffold with steel rollers. These rollers are engaged by turning the release handle, which cannot be accidentally disengaged. Each bracket

CONTRACTORS AND ENGINEERS



Waco climbing brackets permit raising the workmen's platform by merely jacking the winch hoist.

has a safety locking device. As an added safety factor, the winch is designed so that the handle will bend before overloading can cause any damage.

One of the benefits said to result from using Waco brackets is that contractors do not have to scaffold the full height of wall from the first day on the job. The scaffold must be only a frame or two above the completed work. The upper climbing bracket hooks fit securely on any horizontal member of the scaffold without bolting. All that is necessary to move the hooks up is lower the unit until it is supported by the safety device, loosen the aeronautical cables, and take a higher bite with the hooks. There is nothing to take apart and there are no parts to lose or misplace.

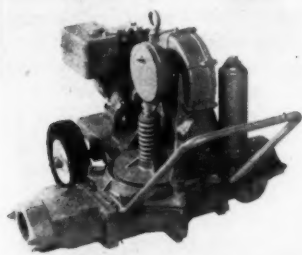
The climbing bracket is designed so that the winch unit is entirely separate. This allows the contractor to select the winch he wants and maintain and store it separately.

Waco Mfg. Co., Dept. C&E, 3565 Wooddale Ave., Minneapolis 16, Minn.

Circle No. 144.

New, improved design in diaphragm pumps

A new line of lightweight diaphragm pumps is offered by the Rice Pump & Machine Co. The pumps are said to be completely new in diaphragm pump design. Speed reduction from engine to pump is accomplished in one step by means of a worm gear drive. This drive elimi-



nates intermediate speed reducers on engines and motors.

The pumps are available with suction accumulators and swing type valves or with ball check valves.

The pumps may be obtained with any standard engine or electric motor and may be furnished without power.

Rice Pump & Machine Co., Dept. C&E, 400 Park Ave., Belgium, Wis.

Circle No. 213.



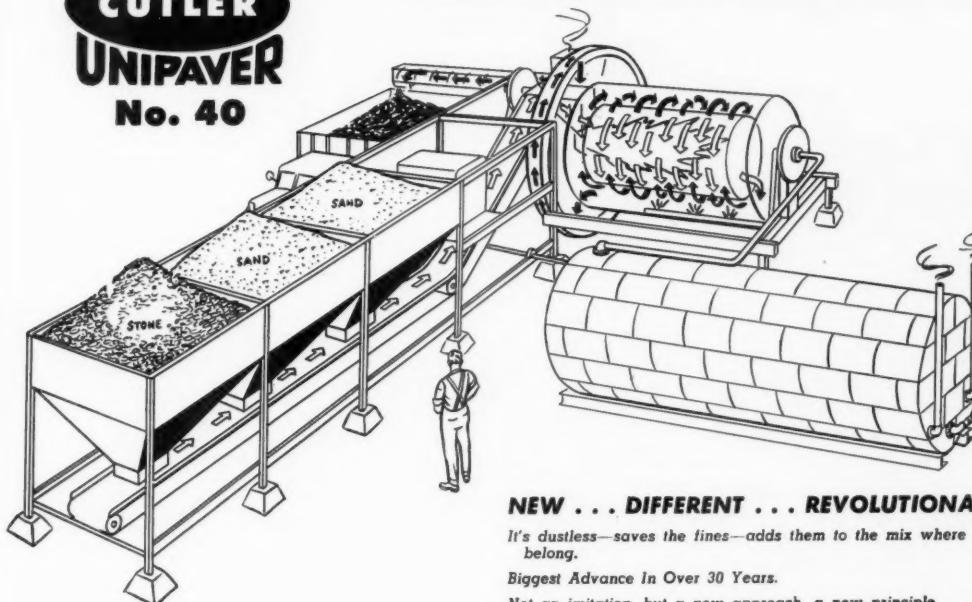
"Why bother with a sheepfoot roller while we're in sheep country?"

Glock

A Big little plant or a little Big plant . . . any way you look at it— it's the BIGGEST VALUE IN A HOT MIX ASPHALT PLANT!

40 Tons per hour—1 Man Operation—Operates both as a continuous mix plant and as a batch plant.

**CUTLER
UNIPAVER
No. 40**



NEW . . . DIFFERENT . . . REVOLUTIONARY

It's dustless—saves the fines—adds them to the mix where they belong.

Biggest Advance In Over 30 Years.

Not an imitation, but a new approach, a new principle.

- Will produce 40 tons per hour of top quality hot mix asphaltic concrete, using 3 or more aggregates, accurately proportioned, thoroughly dried and completely mixed with just the right amount of asphalt cement, cutbacks or emulsions.
- Can operate both as a continuous mix plant or as a batch plant.
- A one man operation, can make quick stops and starts for efficient handling of small lots when required.
- Quality built throughout, heavy and sturdy to stand up under the hard tough wear an asphalt plant must take.
- This compact, low cost operating plant, designed for easy and quick transportation costs no more than some large patching plants.

THE CUTLER UNIPAVER No. 40 is a complete ready to operate plant including the following units:

- A. Aggregate Feeder and Proportioning Unit**
This unit consists of 3—15 ton (45 tons total) aggregate bins, equipped with proportioning control gates, reciprocating feeders and belt conveyors for clean handling and feeding to
- B. The Cutler Double Drum Dryer and Mixer**
This unit, the heart of the plant, employs a new and highly efficient method of drying the aggregate and then mixing it with the asphalt, at unusually low fuel costs and
- C. The Asphalt System**
consists of a 5000 gallon insulated storage tank complete with pump and automatic controlled built in heater.

Write for detailed information on this new and different Cutler Unipaver, that gives more performance and more capacity per dollar invested.

CUTLER ENGINEERING COMPANY | 5435 WEST 63RD STREET
CHICAGO 38, ILLINOIS

Asphalt Specialists in all branches of asphalt heating, processing, handling and paving equipment.

For more facts, use Request Card at page 18 and circle No. 472

Product Parade

This International Harvester tractor-drawn scraper has a capacity of 20 cubic yards heaped and features a new adjustable cutting edge on the bowl.

New spreaders feature adjustable cutting edge

A new adjustable cutting edge for the bowl is among outstanding features offered by two International Harvester tractor-drawn scrapers—the 20-cubic-yard 4S-85 and the 14-cubic-yard 4S-55.

The 4S-85, which carries 16 cubic yards struck, is matched in weight and capacity for use with the International 200-hp TD-24 crawler tractor,

or a unit with similar horsepower. The 4S-55, hauling 10 cubic yards struck, is constructed to team with a machine with the power of the 105-hp TD-18 crawler tractor.

Sideboards boost the material-handling capacity of these new units to 22 cubic yards heaped and 19 cubic yards struck for the 4S-85, and 15 cubic yards heaped and 12 cubic yards struck for the 4S-55.

The new-type cutting edge on the

scraper blades consists of three interchangeable, reversible segments. These permit the operator to shift to one of three cutting depths to match soil conditions and boost loading efficiency. The ground-hugging feature, low draft-arm connections and outside-mounted apron arms on the new units insure fast, positive loading action, according to International Harvester.

Roll-out ejection assures swift dumping, clean discharge of wet, gummy material and controlled, even spread.

Construction Equipment Division, International Harvester Co., Dept. C&E, 180 N. Michigan Ave., Chicago 1, Ill.



Seal Coating Simplified ... and greatly improved!

Single Seal Coating Indianapolis Municipal Airport runway.

LATEST SEAL COAT SPECIFICATION NO. 7 COVERS USE OF ASPHALT EMULSIONS IN ALL TYPES OF SURFACE APPLICATIONS

McConaughay Licensees are always ready to furnish top quality weather-proof seal-coat emulsions for use with cover aggregates of gravel, limestone, granite, slag, or sand. These emulsions have many outstanding features such as... (1) No flow on steep grades and high-crown highways, (2) No bleeding or flowing of asphalt film after breaking of the emulsion, (3) No washing during application, (4) Exceptionally good retention of aggregate, (5) Strong adhesion to treated pavement surface and cover aggregate, (6) Resistance to later softening and loss of aggregate cover on hot days, (7) Resistance to brittle cracking and loss of cover in cold weather. For full details on seal-coat, and for practical solutions to any special paving problems, get in touch with your nearest McConaughay Licensee or contact...

SPECIFICATIONS OF THESE COLD-MIX PROCESSES AVAILABLE ON REQUEST

1 - Penetration Macadam, 2 - Open-Graded Plant Mix, 3 - Open-Graded Road Mix, 4 - Dense-Graded Plant Mix, 5 - Dense-Graded Road Mix, 6 - Mat Coat, 7 - Seal Coat, 8 - Sand Mix, 9 - Sand Honing, 10 - Patching, 11 - Mastic-Mix, 12 - Driveway Construction.

McCONAUGHAY LICENSEES Operating K. E. McConaughay Emulsified Asphalt Plants

1. E. A. Mariani—Emulsified Asphalt Hooker's Point, Tampa, Florida
2. Bituminous Materials Co. Metairie, Louisiana
3. Asphalt Products Co., Inc. Powell Ave., Nashville 4, Tenn.
4. Bituminous Materials Co. P. O. Box 267, Terre Haute, Ind.
5. Wabash Valley Asphalt Co. Terre Haute, Indiana
6. Brookman Construction Co. 17th & Charkey Sts., Muncie, Ind.
7. Fauber Construction Co. Lafayette, Indiana
8. Asphalt Materials & Construction, Inc. 960 E. 22nd, Indianapolis 2, Ind.
9. Ready-Mix Asphalt, Inc. P. O. Box 882, Fort Wayne 6, Ind.
10. Doherty and Swearingen Co. 53 Main St., Yarmouth, Maine
11. James Huggins & Sons, Inc. Medford & Commercial Sts. Malden 48, Massachusetts
12. Albany Asphalt & Aggregates 75 State St., Albany, New York
13. Knight Paving Products, Inc. 1655 Union Rd., Gardenville, N. Y.
14. Knight Paving Products, Inc. Vine Street, Ithaca, New York
15. Knight Paving Products, Inc. 1980 East Avenue, Rochester 10, N. Y.
16. Walsh & Kelly R. R. #2, Gary, Indiana
17. Bituminous Materials Co. 416 S. Water St., Jackson, Mich.
18. Bituminous Materials Co. 318 Atlantic St., Bay City, Mich.
19. Emulsions, Inc. Lawrenceville, Illinois
20. Bituminous Materials & Supply Co. 415 Maple St., West Des Moines, Iowa
21. Spirit Lake, Iowa
22. Iowa City, Iowa
23. Menlo, Iowa
24. Emulsified Asphalt Co. Kuttawa, Kentucky
25. Bituminous Materials Co. Escanaba, Michigan
26. Knight-Bitumen Corp. Watertown, New York
27. Seaco, Incorporated 2700 Industrial Drive, Columbia, S. C.

Eastern Representative:
John A. Dow
157 Church St., New Haven 10, Conn.

K. E. McCONAUGHAY LAFAYETTE INDIANA
EMULSIFIED ASPHALT PLANTS AND PROCESSES

For more facts, use Request Card at page 18 and circle No. 473

Circle No. 45.

New low-resistance oil bath cleaner

Four major improvements are said to be incorporated in the American Air Filter Co.'s new low-resistance Cycoil oil bath air cleaner for smooth flow applications. The cleaner offers a redesigned base for easier and less expensive installation; improved protection at the air intake against snow and water; greater bug protection; and redesigned variflow valves.

Thorough mixing of oil with intake air and positive draining from filter



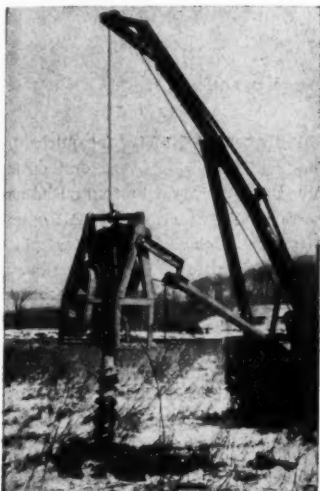
pads are said to insure that 100 per cent of the damaging dust is removed. These new features, plus other advantages such as the perforated entrainment plate principle, reportedly provide complete dust protection for supercharged engines and centrifugal compressors.

The new Type P Cycoil unit answers the need for a highly effective air cleaner on engines with low allowable intake resistance, according to the manufacturer. The Type P-V Cycoil is identical to the Type P except that vari-flow valves have been added on the entrainment plate.

American Air Filter Co., Inc., Dept. PD, 215 Central Ave., Louisville 8, Ky.

Circle No. 176.

To obtain further information on any of the products described in this section, circle the number given at the end of the item on the handy Request Card that is bound in at page 18 of this issue.



The Roper hole digger requires no power take-off for its operation.



Hole digger operates without power take-off

The Roper Mfg. Co. announces the availability of an automatic digging tool said to dig 25-foot holes in 6 minutes. Interchangeable augers ranging from 6 to 24 inches in diameter are available.

Tested by contractors for several years, the Roper digger will dig a straight or angle hole from any jeep, truck, or tractor equipped with front or rear boom and winch.

In addition to the advantage of not requiring an expensive transmission in order to operate, the Roper unit does not require one or two men to ride the auger in order for the digger to dig. The weight of the gasoline motor is more than sufficient.

The digger comes with standard 6-foot augers, with extensions available up to 25 feet.

The Roper Mfg. Co., Dept. C&E, 140 Elm St., Zanesville, Ohio.

Circle No. 145.

Small vibrator heads for tight quarters

The 1 1/4-inch-head WYCO Junior vibrator now can be fitted with two additional sizes of small heads which are interchangeable with the standard Junior head, announces Wyzenbeek & Staff, Inc.

One is 1 3/8 inches in diameter and is said to have the "kick" of a conventional head, with the added advantage of being able to place con-

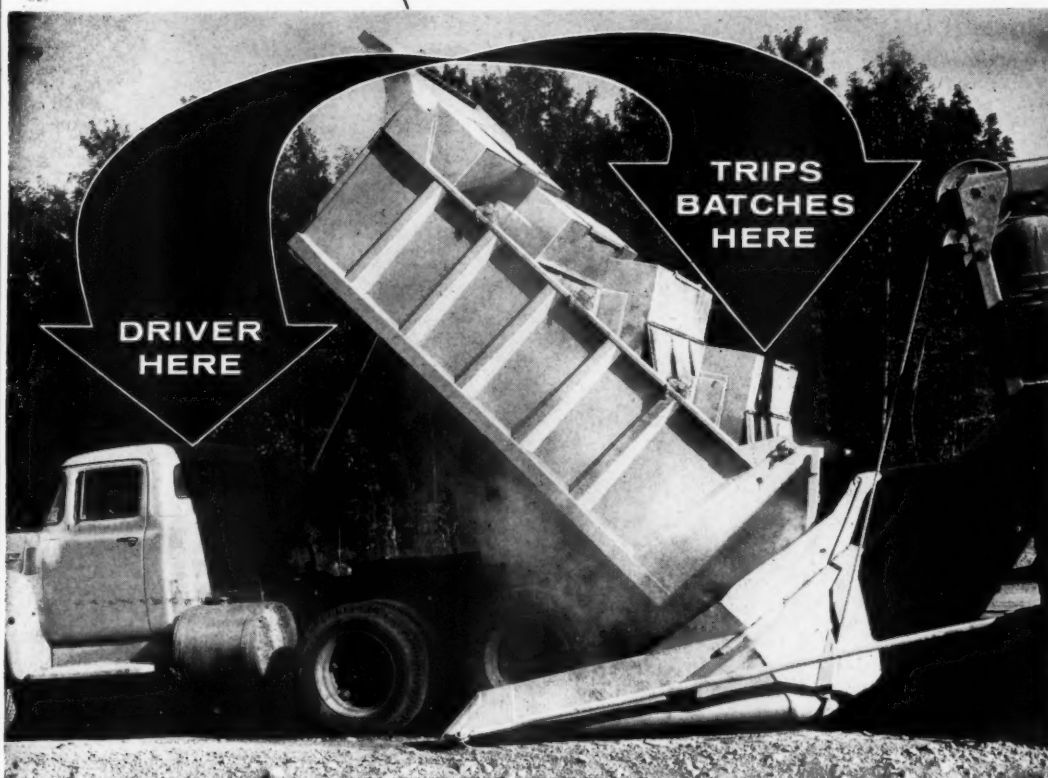


crete in narrow forms crowded with reinforcing bars. The other new head is only 1 inch in diameter—said to be the smallest ever made—and is reported to be of particular interest to the producers of prestressed concrete.

Wyzenbeek & Staff, Inc., Dept. C&E, 223 N. California Ave., Chicago 12, Ill.

Circle No. 163.

Now... split-second batching with **Hercules** HYDRAULIC BATCH TRIPPERS!

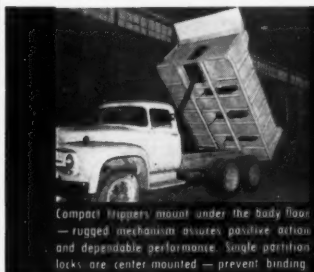


▼ hydraulic tripping units mount under body—are powered by hoist pump

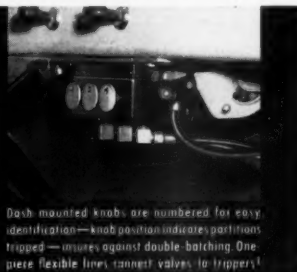
▼ truck backs into skip with hoist raised—driver taps dash control and batch is released—*instantly*

▼ driver controls batching—all controls are located in cab

▼ partitions are re-locked by driver while returning to batching plant



Compact trippers mount under the body floor—rugged mechanism assures positive action and dependable performance. Single partition locks are center mounted—prevent binding.



Dash mounted knobs are numbered for easy identification—knob position indicates partitions tripped—insures against double batching. One piece flexible lines connect valves to trippers!

Batching trucks equipped with Hercules hydraulic trippers will keep pace with your fastest paving schedules . . . reduce your labor costs . . . cut your equipment investment!

The man you used at the paver for the hazardous, back-breaking job of hand tripping can be put to work elsewhere. And, using tandem trucks with Hercules front-mounted telescopic hoists, hydraulic batch trippers and bodies handling 4 or 5 batches in place of smaller trucks, you'll have faster batching speeds with up to 20% less equipment cost. What's more, on a 3 paver operation, labor savings can pay for the trippers in less than a month!

Ask your nearby distributor to show you how Hercules batching hoists and bodies can increase your paving production and your profits . . . while cutting your labor and equipment expense! AA-8078



HERCULES STEEL PRODUCTS COMPANY • GALION, OHIO

For more facts, use Request Card at page 18 and circle No. 474



This extra-heavy-duty water tank for compaction operations is made by The Sioux City Foundry & Boiler Co.

Improved water tank for compaction work

A new model of its extra-heavy-duty water tank is announced by the Sioux City Foundry & Boiler Co. The unit is available in four sizes ranging from a 9-foot-long model with a capacity of 1,080 gallons to a 14-foot-long unit with a 2,000-gallon capacity.

Made of heavy-gage steel shell and heads, the tanks are furnished complete with saddles, I-beams, cross sills, and I-beam longitudinal sills to make a completely integrated unit ready for mounting on a truck frame.

The hinged opening atop the tank

is 18 inches in diameter for quick filling, and the 2-inch rear end outlet plus the 3-inch rear bottom outlet assures ample water supply. All openings are backed with heavy plate reinforcement.

The oval shape and baffles are said to permit the truck to travel at high speeds and negotiate curves safely.

The Sioux City Foundry & Boiler Co., Dept. C&E, E. Eighth St. & Division St., Sioux City, Iowa.

Circle No. 188.



Field joints in minutes with Beth-Cu-Loy pipe

Pipe made of Beth-Cu-Loy is pipe made of galvanized, corrugated copper-bearing steel. That means the pipe is strong, durable, flexible. It also means easy and rapid couplings. In fact, Beth-Cu-Loy joints can be assembled in the field in a matter of minutes.

With Beth-Cu-Loy, mechanical field joints are used. A corrugated coupling band overlaps and nests into the corrugations in the abutting ends of the pipe sections. A crescent wrench and C-clamp are usually the only tools needed to make a joint which will be both tight yet flexible.

Flexibility, incidentally, is another important advantage of Beth-Cu-Loy drainage pipe. It permits the pipe to flex with the fill, absorb vibration and impact,

as well as the shifting actions of weather changes.

The copper in Beth-Cu-Loy adds to the stout corrosion-resistance initially provided by the heavy zinc coating. You can be sure that pipe fabricated from Beth-Cu-Loy will give long, trouble-free service.

Bethlehem manufactures the galvanized corrugated sheet stock used by fabricators of culverts and drainage pipe. If you would like to have the names of those who can supply pipe made from this long-lasting, versatile steel, just call the nearest Bethlehem office.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL



For more facts, use Request Card at page 18 and circle No. 475

Heavy-duty fork lift is versatile unit

The Elmco Corp. has introduced a new heavy-duty fork lift featuring hydraulically-operated four-way tilting and leveling. The unit is mounted on a crawler tractor with 143-horsepower and torque converter.

Capable of lifting 15,000 pounds to a full reach height of 14 feet, the machine is said to be suitable for almost any application requiring reach, high



The horizontal tilting-leveling mechanism on Elmco Corp.'s new, Model 105 fork lift makes it a versatile tool for use in both material-handling and maintenance.

power, and maneuverability. It is offered as an attachment for the Elmco Model 105 tractor.

For maximum visibility and greater work control, the Elmco fork lift seats the operator at the front of the machine. Uni-drive transmission, with independent track reversal for spin turns, gives the fork lift versatility and operating ease even under close working conditions, the company states.

The fork lift is interchangeable with the Elmco front-end loader attachment, and is said to provide a unit flexible enough to meet materials-handling jobs on uneven or sloping ground as easily as in prepared storage areas.

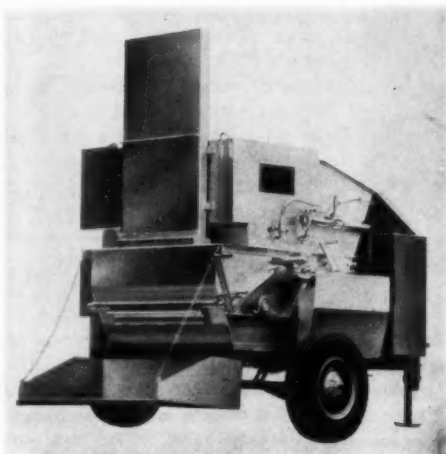
The Elmco Corp., Dept. C&E, 654 S. Fourth West Street, Salt Lake City, Utah.

Circle No. 59.

For more facts on these products, circle the indicated number on the Request Card at page 18.

CONTRACTORS AND ENGINEERS





The McConaughay No. 10 asphalt-patching mixer has a 200-gallon capacity.

New half-ton capacity asphalt-patching mixer

The new McConaughay HTD No. 10 mixer, said to be one of the largest trailer-type asphalt-patching mixers available, is designed for use with asphalt cements, cutbacks, emulsions, or tars.

The unit features a twin pugmill mixer, positive proportioning with power-driven pump and counter, a low-pressure burner shielded from wind and elements, dust-free operation, and replaceable liners.

Weight of the mixer is 5,000 pounds. The asphalt tank has a 200-gallon capacity.

McConaughay Mixers, Inc., Dept. C&E, 424 Columbia St., Lafayette, Ind.

Circle No. 143.

Line of steam cleaners for maintenance work

Finger-tip control of flushing and rinsing capacities up to 480 gph is a reported feature of the Model 1858 Hypressure Jenny, one of eleven new steam cleaner models announced by Homestead Valve Mfg. Co.

Known as the Series 1800, this line of steam cleaners has 180-gph steam-cleaning capacity for removing dirt



and grease from construction machinery, parts, and other equipment.

Designed especially for extra-heavy-duty cleaning, and for either single-gun or two-gun operation, this cleaner series offers a choice of oil-fired or gas-fired units in stationary, portable, or trailer-mounted types. Units are also offered with gasoline-engines.

Homestead Valve Mfg. Co., Dept. C&E, P. O. Box 550, Coraopolis, Pa.

Circle No. 62.

TYING WIRE?

Speed YOUR Job with Ideal Reel

and do it SAFELY!
at less COST!

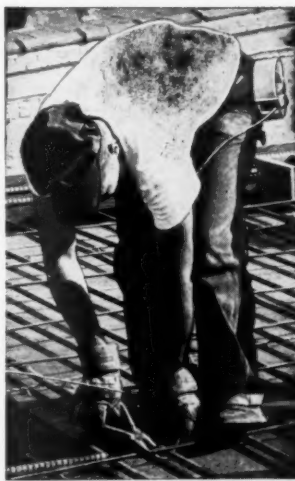
FOR BRIDGES, DAMS, CULVERTS, FLOORS, WALLS, AND OTHER JOB APPLICATIONS.

High Production Increase with IDEAL Reels

	Ties Per Min. with Ideal Reel	Ties Per Min. Using Shoulder Roll	Percentage of Increase
MAN X	1st Try 20	16	25%
	2nd 20	14	42.8%
	3rd 23	16	42%
MAN Y	1st Try 29	21	38%
	2nd 27	22	22%
	3rd 27	21	28.5%
MAN Z	1st Try 23	18	28%
	2nd 24	18	33.3%
	3rd 24	16	50%

AVERAGE INCREASE, 34.4%

Have you seen IDEAL reel in action? If not, call your nearest dealer for a free demonstration or clip this ad to your letterhead and mail to IDEAL REEL COMPANY, Paducah, Ky., for full details.



For more facts, use Request Card at page 18 and circle No. 476



D9's and D8's show peak production on Olin Mathieson's \$95-million Ohio plant!

When Allegheny Contracting Industries, Inc., Pittsburgh, Pa., took on an 8,500,000 cubic yard earthmoving contract for Olin Mathieson's new \$95-million aluminum plant near Hannibal, Ohio, this construction firm brought in its big team of torque converter-equipped Caterpillar D9 and D8 Tractors to handle the giant sized "landscaping" job.

Using the powerful D9's (currently 320 flywheel hp) and D8's as pushers, one hour and weight study taken of five Cat DW21 Tractors showed an average hourly production to be 150 bank cubic yards per hour per machine on a 1500-ft. one-way haul.

"We give the torque converter a lot of credit for our high-production per-

formance," says Allegheny's Vice-President W. J. Parish. "We're handling loose sand and gravel... and the going can get mighty rough at times. The weather has been against us on this job — yet our torque converter-equipped machines do not 'dig in' on a hard pull."

The torque converter drive of the Cat-Built Tractors, which standardizes on Twin Disc Torque Converter components, matches the machine's output torque to the load, regardless of operating conditions... cushions out shocks and vibrations to reduce parts wear and breakage... minimizes or eliminates gear-shifting... provides accurate load control... and improves over-all flotation.

Specify a torque converter in your next Caterpillar D9 or D8 Tractor. Enjoy the benefits of greater productivity — bigger profits.

Twin Disc Clutch Company, Racine, Wisconsin; Hydraulic Division, Rockford, Illinois.

This torque converter-equipped Cat D9 Tractor is push-loading DW21 Tractors and Scrapers at peak-level performance on Olin Mathieson's giant aluminum plant site. Twin Disc components are standard for the D9's torque converter drive.



TWIN DISC CLUTCH COMPANY, Racine, Wisconsin • HYDRAULIC DIVISION, Rockford, Illinois
Branches or Sales Engineering Offices: Cleveland • Dallas • Detroit • Los Angeles • Newark • New Orleans • Tulsa
For more facts, use Request Card at page 18 and circle No. 477

Product Parade

The new Cat DW15 has a 10-speed transmission, and offers working speeds from 2.7 to 37.2 mph.

New scraper features greater capacity, speed

A new four-wheel prime mover and matching scraper combination, offering increased load capacity, higher speeds, and greater tractive ability, has been announced by Caterpillar Tractor Co.

The rubber-tired unit is the Caterpillar DW15 (Series E) tractor and No. 428 Lowbowl scraper. The tractor is said to incorporate design changes in several major components, including the engine and power train.



The new matched scraper is designed to utilize fully the tractor's output in obtaining maximum production, and incorporate Lowbowl design to facilitate fast loading.

A new Caterpillar diesel engine that

develops 200 (maximum output) horsepower at 2,000 rpm has been designed for the unit. According to the company, features incorporated into the engine make use of natural engine lug characteristics to accom-

plish a 23 per cent torque rise and high rim-pull over a wide speed range, decreasing the need for gear changes.

Besides offering wide-range torque characteristics, the new DW15 has a 10-speed transmission, which offers working speeds from 2.7 to 37.2 mph. Top speed is said to be 14 mph faster than the predecessor model.

The No. 428 scraper incorporates Lowbowl design similar to that introduced by Caterpillar on its larger model scrapers. With a struck capacity of 13 cubic yards, the unit has an increase of 4.1 cubic yards over its predecessor, the No. 15 scraper. Heaped capacity of the new scraper is 18 cubic yards, which is 4 cubic yards more than the previous model.

Caterpillar Tractor Co., Dept. C&E, Peoria, Ill.

Circle No. 210.

Hard-surfacing machine is fully automatic

A fully-automatic machine for hard-surfacing disks, grader blades, and similar thin-sectioned parts is announced by L & B Welding Equipment, Inc.

Designated the Optiflame Model D, the machine is said to use a unique light-temperature response system for automatically-controlled preheat, weld heat and post heat. Hard-surfacing wire is fed with positive pressure against the work piece through an oscillating feeder which "wipes" the rod against the work to break up scale and oxides, and to keep the puddle clean. Its action is said to assure uniformly top-quality deposits of all popular alloys, including tungsten carbides. Stick electrodes may also be used.

Simplified push-button operation

TDA[®] BRAKES

if it moves...we can stop it



longer life with genuine factory brake replacement parts

Only genuine factory replacement parts are a true match in quality for the original equipment. A major reason for Timken[®] brake superiority is the care and precision with which every part is produced. These same exacting standards assure equal superiority in Timken-Detroit[®] brake replacement parts. Each TDA replacement part is rust-proofed, heat-treated or conditioned as required to meet original equipment specifications. This assures the same long-lasting, trouble-free service as the original part.

Save on man-hours and maintenance! All TDA factory replacement parts are identical with the original. This assures "original equipment fit" for every installation... makes certain replacement is fast and easy.

©1956, R S & A Company

Remember, only the authorized dealer or branch of your original equipment manufacturer is equipped and qualified to supply you with the genuine high standard replacement parts you need for efficient maintenance.

For expert consultation on any brake problem, contact the Timken-Detroit Brake Division. A staff of experienced engineers is ready to assist you without cost or obligation.

For every industrial, agricultural or automotive application where braking is required.



TDA Plants at: Detroit, Michigan • Oshkosh, Wisconsin • Utica, New York
Ashtabula, Kenton and Newark, Ohio • New Castle, Pennsylvania

For more facts, use Request Card at page 18 and circle No. 478



TRANSITS & LEVELS

You will find the best bargains at Warren-Knight.

- New or rebuilt transits and levels—for sale or for rent.
- We will repair, buy, or trade your used Transits, Levels, Alidades, etc.
- Send your instruments for repair estimate and trade-in valuation.

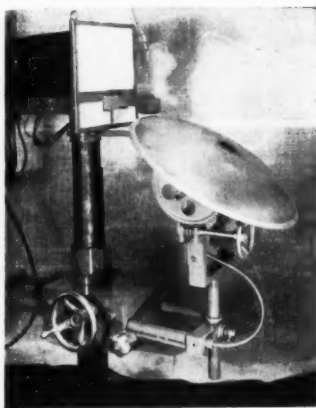
Write for free information EC-76 of instruments, field equipment and drafting room supplies.

Send for free information EC-76



For more facts, circle No. 479

CONTRACTORS AND ENGINEERS



Output of the Optiflame Model D hard-facing machine is reportedly 5 to 8 times that of manual application.

eliminates the need for highly skilled, trained operators. Output is said to be 5 to 8 times that of manual hard-surfacing, with further savings in gas ($\frac{1}{3}$ to $\frac{1}{2}$ of that usually consumed in manual work), and in elimination of stub losses on rod by use of the coiled continuous rods now available in virtually all alloys.

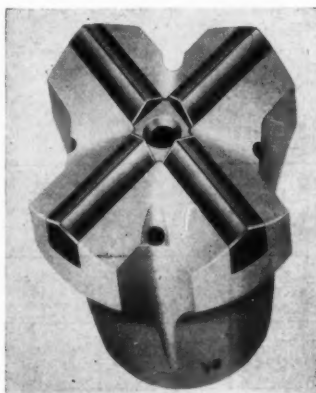
L & B Welding Equipment, Inc., Dept. C&E, 2424 Sixth St., Berkeley 2, Calif.

Circle No. 211.

Announce new series tungsten-carbide bits

A new series of rock bits with tungsten-carbide inserts made to fit directly on Type 600 and 1,000 series steels is announced by Vascoloy-Ramet Corp.

Designed with the inserts mounted in an X-formation, these new bits are said to eliminate rifling and to pro-



vide uniformly round holes in hard ground. V-R X-style bits feature 5-hole construction and wide chip channel design for faster removal of chips.

Exclusive carbide grades manufactured by V-R are "precision positioned" in a non-fatiguing, alloy-steel body and triple tempered.

Style 600 X bits are available in 3, 3 $\frac{1}{4}$, 3 $\frac{1}{2}$, 4, and 4 $\frac{1}{2}$ -inch diameters. Style 1,000 X bits are presently available in 4, 4 $\frac{1}{2}$, and 5-inch diameters.

Vascoloy-Ramet Corp., Dept. C&E, 800 Market St., Waukegan, Ill.

Circle No. 63.



Square wheels for the conversion of rubber-tire tractors are available from Airline Tramways. A unit equipped with square wheels is said to have twice the drawbar pull of a rubber-tire machine. The all-metal wheel, which employs a crawler-type track, requires no lubrication and is said to have an exceedingly long work-life, with repairs infrequent and inexpensive. Airline Tramways, Dept. C&E, Tramway Hill, Route 6, Spokane 14, Wash. Circle No. 199.

K-45 Kompactor compacts California 399



for Guy F. Atkinson Company on \$1,736,000 Ventura-to-Ojai highway construction job

To meet density specifications and speed compaction, Guy F. Atkinson Company of South San Francisco, California, uses the Buffalo-Springfield K-45 Kompactor on this

Material before compaction on the Ventura-Ojai highway job. (Pack of cigarettes shows comparative size.)



After 3 passes by the K-45 Kompactor. Note surface uniformity. (Cigarette pack for comparison.) Density specifications also have been met in record time.

project between Ventura and Ojai, California.

Operating at fast speeds, 4 to 5 mph, the self-propelled, highly maneuverable K-45 cuts compaction

time substantially from that normally required. It further shortens time by giving compaction to meet specified densities with fewer passes.

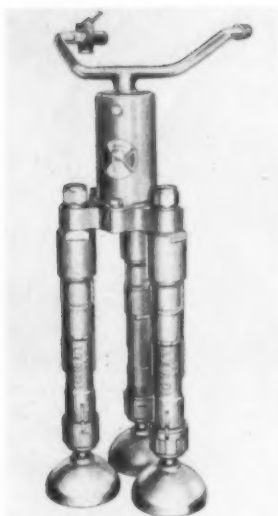
The K-45's "Interrupted Pressure Principle" design places heavy steel pads in staggered rows around each of 4 large diameter wheels. All compaction effort is directed downward with minimum displacement on entering and leaving the compacted area ... gives a better finished surface.

Send now for Bulletin S-64854. See your nearest Buffalo-Springfield distributor for a demonstration on the job.

The Standard  of Comparison
**BUFFALO-SPRINGFIELD
ROLLER COMPANY**
SPRINGFIELD, OHIO

Watch for these Machines in Action!

For more facts, use Request Card at page 18 and circle No. 480



The new Le Roi OT11 triple tamper has a built-in line oiler and a handle grip throttle valve.

New triple tamper has built-in oiler

A new triple tamper with built-in line oiler to assure positive oil feed while the tamper is in operation is being manufactured by the Le Roi Division of Westinghouse Air Brake Co.

The OT11 tamper has a handle-grip throttle valve incorporating a safety snap action which shuts off the air supply when the lever is released. This safety snap shut-off action is said to increase operator safety and reduce lost-time accidents. A plug-type throttle is available as optional equipment.

The tamper's line oiler has an adjustable oil regulator, as well as plates to prevent excessive oil foaming. The 1¼-quart capacity of the oiler allows a full 8-hour day of operation with one filling, according to the manufacturer.

Operator safety reportedly is increased with the long handle bars, which have comfortable handle grips. The air hose connects to the back of the right handle grip, preventing the air line from interfering with the operator or tamper butts. The throttle valve is also located on the right handle grip.

The three tamper butts cover a 70-square-inch area, compacting the same amount of backfill as five single tampers. Many man hours, air compressor service, and fuel costs are thereby saved, the company points out. The tamper butts are mounted on the piston stems by a locking taper of bolted construction. All major working parts are steel drop forged for added strength.

Le Roi Division, Westinghouse Air Brake Co., Dept. C&E, 3716 W. Wisconsin Ave., Milwaukee 14, Wis.

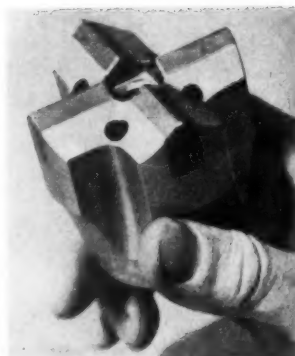
Circle No. 113.

To obtain further information on any of the products described in this section, circle the number given at the end of the item on the handy Request Card that is bound in at page 18 of this issue.

New line of detachable tungsten-carbide bits

Atlas Copco Eastern, Inc., has announced a new line of long-life Sandvik Coromant detachable bits incorporating tungsten-carbide inserts. The 16 bits in the new line—designed for all rock drilling needs—range from 3/8 to 4½ inches in diameter.

The extra large Sandvik Coromant inserts in these bits are said to insure high footage and extremely low cost per foot drilled. The company also reports that the precision grinding of carbide surfaces insures smooth drilling because the load is distributed equally to all four tungsten-carbide inserts.



The new bits are used on standard shoulder-type drill rods with F, H, D, and K threads. Sizes range from the

model with 1¾-inch bit diameter and 7/8-inch F thread to a unit with 4½-inch bit diameter and 1 11/16-inch K thread.

Atlas Copco Eastern, Inc., Dept. C&E, 151 Linwood Ave., Paterson, N. J.

Circle No. 155.

Level attachment saves time, insures accuracy

An attachment that automatically provides and maintains a level or horizontal optical line of sight is announced by the David White Instrument Co. The new device, when attached to a surveying instrument, is

KOEHRING WORK CAPACITY in action . . .



Take another look at this Mid-West quarry operation. It introduces the ¾-yard 305 — latest in a new series of Koehring heavy-duty excavators and cranes. Better check its all-around versatility and extra work capacity for digging, lifting and material-handling (more details are listed below).



On 13.4-mile highway contract in one of the central states, 1,500 to 2,000 tons of aggregates were handled daily by Koehring 605 clamshell crane. Its wide work-radius speeded stockpiling, and charging into Johnson bin. Contractor also maintained fast schedule at other end of job, where two Koehring 34-E twinbatch® pavers poured 24-foot concrete pavement, 9 inches thick.



To eliminate a bottleneck on this highway widening job, it was necessary to rebuild bridge, and widen the approaches. Concrete pilings were set and driven by Koehring 405 crane. It has up to 20-ton lift capacity, boom lengths from 40 to 90 feet. Or, for maximum reach, 80-foot boom can be used with 15 to 30 feet of jib.

Here are some figures that will interest you:

KOEHRING MODEL	SIZE DIPPER	LIFT CAPACITIES	
		(Crawler ratings based on 75% of tipping load. Rubber-tired machines — 85% of tipping load.)	
205 CRAWLER	1½-Yd.	20,000 lbs.	at 10-foot radius
205 ON RUBBER	1½-Yd.	30,000 lbs. 13,700 lbs.	at 12-foot radius at 20-foot radius
305 CRAWLER	¾-Yd.	30,000 lbs.	at 12-foot radius
305 ON RUBBER	¾-Yd.	50,000 lbs. 15,800 lbs.	at 10-foot radius at 30-foot radius
405 CRAWLER	1-Yd.	40,000 lbs.	at 12-foot radius
605 CRAWLER	1½-Yds.	72,300 lbs.	at 12-foot radius
1205 CRAWLER	3-Yds.	190,000 lbs.	at 13-foot radius

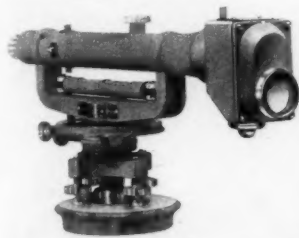


Want more information? Call Koehring distributor today.

CONTRACTORS AND ENGINEERS

said to afford the accuracy of a second order instrument.

The small and compact instrument



can be attached, by an adapter, to the objective end of a telescope of any make level or transit. When in

place, it is not necessary to carefully adjust the level or transit before each sight is made. The instrument may be "out of level" to the extent that the bubble in the level vial is two divisions off center; yet, when using the attachment, the line of sight will remain in a true horizontal plane. The new attachment is said to insure unfailing accuracy, even when readings are taken with an unlevel instrument. In addition, vibrations, stepping near a tripod, movement of trucks and equipment, and other disturbances do not interfere with the accuracy of the sight, according to the manufacturer.

The attachment may be installed on any telescope with the range of

the adaptor that is used.

David White Instrument Co., Dept C&E, 2051 N. 19th St., Milwaukee 5, Wis.

Circle No. 196.

Portable bucket pump for easier lubricating

A new portable bucket pump featuring an exclusive Adjusto Lever which reportedly makes it easy to pump either oil or grease in the coldest weather and at pressures of 2,500 to 5,000 pounds, has been announced by the Alemite Division of Stewart-Warner Corp.

The Big A pump is said to introduce

new savings in both time and money through portability, fast fill, and easy service. One wrench disassembles the entire unit.

Available in seven models for all types of lube fittings, the bucket pump features a gasket-sealed cover eliminating dirt and moisture from the lubricant and spillage on the job. Ac-



cording to the manufacturer, an exclusive Dynamic Primer insures constant delivery, and a new foot valve assures full pressure at every stroke, using any lubricant, in any weather.

With a lubricant capacity of 35 pounds, the bucket pump is said to be capable of lubricating hundreds of bearings with fewer refills.

Alemite Division, Stewart-Warner Corp. Dept. C&E, 1826 Diversey Parkway, Chicago 14, Ill.

Circle No. 64.

Market diaphragm pump with high head capacity

A new diaphragm-type pneumatic pump for high head pumping has been announced by the Layton Co., Inc.

This light and compact pump is especially recommended for construction work. It is said to be an excellent sump pump for tunnel work to keep headings dry, and is readily adaptable to deep shaft work, where it will pump



with a head of 100 feet or more. The pump can operate in a shallow trench and is well suited for operation and portability along the top of a trench.

The new pump is 22 inches high, 12 inches in diameter, and weighs 65 pounds.

The Layton Co., Inc., Dept. C&E, 4749 S. Whitnall Ave., Cudahy, Wis.

Circle No. 72.

Reinforced concrete slabs

on this West Coast building job required careful handling — and plenty of lift capacity. Contractor brought in 2 Koehring truck cranes — a 25-ton 304, and this 15-ton 205. They often worked as a team, using combined lift capacities to handle heavy slabs, and erect structural steel. On next job, in the Sierras, the 205 truck crane hoisted and placed pumps and other heavy machinery at construction site for new dam. Its travel is unrestricted. Axle-load meets highway regulations in most areas — even when carrying 25-foot crane boom over the steering end.



KOEHRING COMPANY Milwaukee 16, Wis.

Subsidiaries: JOHNSON
PARSONS • KWIK-MIX

For more facts, use Request Card at page 18 and circle No. 481

ANOTHER HANSEN ON-THE-JOB



45-Ft. Tug in East Coast Service

Hansen Tugs and Sea-Trucks are "catching-on" as a safe, fast, powerful, and economical method of moving materials and men off-shore. The Garden State (above) is a repeat order from a large harbor and dredging contractor. It is diesel powered, all-welded construction with a 12½-foot beam. Used mostly for towing, the Garden State is also a dredge tender and handles line pipe. There are crew accommodations for three men. Hansen boats do not require a licensed crew. Standard models include lavatory, toilet, horn, life jackets, running lights, etc. Buyer's choice of 150 to 400 h.p. diesel engine. If you are planning any off-shore job . . . drilling, piers, pipe line, dredging, bridge, or piling, let Hansen design a boat to your specifications.

HANS HANSEN WELDING Co.

2824 Summit St.
Toledo, Ohio

For more facts, use Request Card at page 18 and circle No. 482

Product Parade



The Chausse expansion joint melting kettle is equipped with a temperature-controlled crack filler.

Joint filler applied at kettle temperature

A crack-filling device that permits the application of filler substance at kettle temperature is one of the features of the expansion joint melting kettle offered by Chausse Mfg. Co., Inc.

The kettle is available in two models designated the R-55A and R-115A. A portable unit, its equipment includes a roller chain agitator driven by an air-cooled 2-hp engine. Two propane TA-3 burners are contained in the unit, one fully automatic, the other manual. Oil capacities are 35 gallons for the R-55A, and 65 gallons for the larger model.

The crack filler is a fully insulated 2-gallon container, equipped for temperature control with a 50-foot plug-in cord.

Chausse Mfg. Co., Inc., Dept. C&E, 4453 14th St., Detroit 8, Mich.

Circle No. 185.

**YOU NAME
THE JOB!**

THERE'S A

HOPTO

MODEL FOR IT

HOPTO MODEL 360 57-90—Big-capacity 90 GPM triple tandem pump and split hydraulic system handles half-yard backhoe. Full 360° continuous swing from over cab position.

HOPTO MODEL 200 DTM 57-72—Split hydraulic system with 72 GPM triple tandem pump handles up to 30" backhoe. Offers 200° continuous swing.

HOPTO MODEL 190 SPC—Complete self-propelled track unit handles up to 30" backhoe. 190° continuous swing.

HOPTO MODEL 80 CTM—A HOPTO unit adapted for quick attachment to crawler tractors. 180° continuous swing.

HOPTO MODEL RTM—A HOPTO designed for mounting on rubber tired tractors. Handles up to 30" buckets. 180° continuous swing. Front end loader mounts directly on HOPTO frame.

HOPTO TRAILER MODEL—Available in self-powered or PTO-drive models. Offers 180° continuous swing, all around utility at low cost.

Heaviest-duty, Largest GPM Hydraulic System Available

GET THESE HOPTO ADVANTAGES:

- Fast-cycling, completely hydraulic operation—no clutches, brakes, drums or cables.
- Simple, feather-touch hydraulic controls.
- Rugged hydraulic systems with generous overload factors, large oil reservoirs, heavy-duty pumps and valves.
- Wide selection of interchangeable backhoe or shovel buckets, log grapples, magnets or crane attachments.

STILL MORE MODELS

HOPTO offers 3 models for truck mounting, self-powered or PTO-drive trailer models, and the self-propelled rubber-tired Model SPR.

Write today for complete information or see your HOPTO Dealer!



BADGER MACHINE COMPANY

DEPT. E • WINONA, MINNESOTA

For more facts, use Request Card at page 18 and circle No. 483



This Eager Beaver portable concrete drilling machine will drill clean holes up to 4 inches in diameter and up to 18 inches or more in depth at cutting rates of up to 2 inches per minute. It will also cut through steel reinforcing bars, using specially designed diamond-tipped bits that require no sharpening. The machine, described as practically noiseless, is designed to drill either horizontally or vertically and is powered by plugging into any 110-volt electric circuit. Beaver Products, Inc., Dept. C&E, P. O. Box 101, Somerset, Ky. Circle No. 212.

CONTRACTORS AND ENGINEERS

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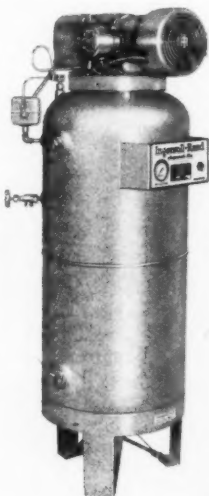
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Stationary compressor for maintenance shops

A new stationary air compressor recommended for use in contractors' repair and service shops is announced by Ingersoll-Rand. The unit is a two-stage, 200 psi motor-compressor presently available in 1½ and 2-horsepower sizes. The complete packaged unit includes the motor-compressor, cushioned rubber mounting



on an ASME vertical tank, interconnecting piping and fittings, and automatic start-and-stop control.

The manufacturer claims important safety and space-saving features for this new unit. Troublesome and hazardous belt drive is eliminated because the compressor is flange-mounted directly on the driving motor. The direct mounting permits the Channel-Flo unit to occupy less than half the floor space of tank-mounted, belt-driven units of comparable size. It can also be mounted on a shelf, side wall, or overhead bracket with the air receiver located in an out-of-the-way space.

The new motor-compressor features balanced-opposed piston construction, direct motor drive without belts or coupling, and a new piston ring design which is said to result in unusually low oil consumption.

Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.

Circle No. 157.

New moil points offered in four shank sizes

A line of moil points for pneumatic hammers has just been announced by Allied Steel & Tractor Products, Inc.

According to the manufacturer, Bulldog moil points are forged from special alloy steels, heat-treated to give a balance between toughness and hardness.

Bulldog moil points are made in four shank sizes from 7/8 x 3 1/4 inches to 1 1/4 x 6 inches. Collar lengths are in 14, 18, 24, and 30-inch sizes.

Allied Steel & Tractor Products, Inc., Dept. C&E, 7835 Broadway, Cleveland 5, Ohio.

Circle No. 267.

Case history: Use of Deslauriers steel column molds in the construction of Chicago's new filtration plant is resulting in a 30 per cent savings in concrete for the Herlihy-Mid-Continent Co., Chicago contractor. Supporting the roof of the ten acre 68-million-gallons-per-day reservoir are 775 concrete columns. These are formed by the steel molds which come in sections and can be assembled to form columns of any required height and diameter. For further information about these molds, write to Deslauriers Column Mold Co., Dept. C&E, 5036 W. Lake St., Chicago, Ill. Circle No. 151.



GALION GRADE-O-MATIC MOTOR GRADERS



Model T-700
190 h.p.
40,125 lbs.

Model T-600
140 h.p.
30,420 lbs.

Model T-500
125 h.p.
20,765 lbs.



Federal Highway Contracts Need GRADE-O-MATIC PERFORMANCE

Galion GRADE-O-MATIC Graders are the result of BIG thinking for the BIG jobs ahead! Designed and built to smash the barrier of yesterday's narrow concepts of performance, they help operators achieve amazing results under every working condition.

Automatic torque multiplication as needed . . . power shifting . . . automatic adjustment of engine speed to the load . . . elimination of foot clutch . . . prevention of engine lugging and stalling . . . absorption of shock loads . . . utmost "push-power" at the blade — these features mean moving more material, in quicker cycles, with less operator fatigue, and less downtime for maintenance.

If you are faced with BIG jobs — it will pay you to get the facts on Galion GRADE-O-MATIC Graders. Write for literature today.



THE GALION IRON WORKS & MFG. CO., General and Export Offices, Galion, Ohio, U.S.A.
Cable address: GALIONIRON, Galion, Ohio

For more facts, use Request Card at page 18 and circle No. 484



Euclid's Model SS-24 is a six-wheel scraper with a heaped capacity of 31 cubic yards.

Big six-wheel scrapers carry 18, 24-yard loads

Two big rubber-tire scrapers of 18 and 24-yard struck capacity, both displayed for the first time at the ARBA Road Show in January, are among new Euclid products available for the important earthmoving phases of the expanded road building program.

Known as the SS-18 and SS-24, they are said to provide larger capacities for long-haul, high-speed applications where the stability of a four-wheel tractor counts.

The Model SS-18 is an improved and revised version of Euclid's 15.5-yard model, but with a longer and lower bowl than the old side-boarded unit. It is rated at 60,000 pounds payload and carries up to 25 yards heaped. It is powered by either GM or Cummins 300-hp engines, and has standard 24.00x25 drive and scraper tires, with 29.5x25 tires optional. The power train incorporates a 3-speed Allison Torqmatic drive.

The SS-24 carries up to 31 yards heaped, and incorporates an all-new tractor powered by either a 300-hp GM or 335-hp turbocharged Cummins engine, both models having a 4-speed Allison Torqmatic drive. A pilot model has been in service for a year.

The new tractor has a box-beam frame and trunion front axle, and employs Euclid's largest planetary drive axle for the first time on a scraper. Standard tires are 27.00x33 with 33.5x33 tires optional.

Euclid Division, General Motors Corp., Dept. C&E, 1361 Chardon Road, Cleveland 17, Ohio.

Circle No. 41.

Compact new tape rule features flexible blade

A new tape rule with a 1/4-inch-wide blade has been announced by The Lufkin Rule Co. The Executive Thin-line, an addition to the Lufkin White Clad series, is available in both 6 and 8-foot lengths.

The new tape rule is compact and extremely lightweight. Its lack of bulk and weight are said to make it ideal as a pocket tape. It has a highly polished bright chrome finish on a smoothly contoured steel case, and is about the size of a silver dollar.

The Lufkin Rule Co., Dept. C&E, Saginaw, Mich.

Circle No. 46.

Three bolts can do the work of four

Three bolts positioned 120 degrees apart around a common center will provide as stable a joint as the conventional pattern of four bolts arranged symmetrically, according to fastener experts of Russell, Burdsall, & Ward Bolt & Nut Co.

Savings in assembly—made possible by fewer holes to drill and fill—are a major advantage of the three-bolt joint. Savings in cost of fasteners are said to be significant as well.

The holding capacity lost in using fewer bolts is made up by using stronger ones. This alternative still permits savings in the cost of fasteners. For example, either four 3/4-inch bright cap screws or three 3/4-inch high tensile bolts may be used to carry an 80,000-pound load safely. But three of the high strength bolts cost less than four of the cap screws.

In terms of holding power, the stronger the bolt, the less it costs. RB&W engineers calculate that a dollar's worth of holding power in high-tensile bolts costs \$1.50 when



bright cap screws are used and \$1.65 with machine bolts.

High tensile bolts, identified by three radial dashes on the bolt head, have a high carbon content and are heat-treated to increase strength. They are rated at 120,000-psi tensile strength. Bright cap screws, identified by their bright finish, are produced to rigid dimensional tolerance.

Russell, Burdsall & Ward Bolt & Nut Co., Dept. C&E, 100 Midland Ave., Port Chester, N. Y.

Circle No. 71.

Shown mounted on an International 350 utility wheel tractor is the Sooner Boomer, a sideboom pipe-laying assembly manufactured by Pneumatic Pipelayers, Inc. Designed to handle pipe up to 10 inches, the 12-foot-long boom also makes it possible to lower in over spoil. Use of the boom eliminates the need for pipe stringing along city streets ahead of ditch. It operates at road speeds on back haul, and is equipped with a swamper platform. Pneumatic Pipelayers, Inc., Dept. C&E, P. O. Box 8832, Oklahoma City, Okla. Circle No. 195.

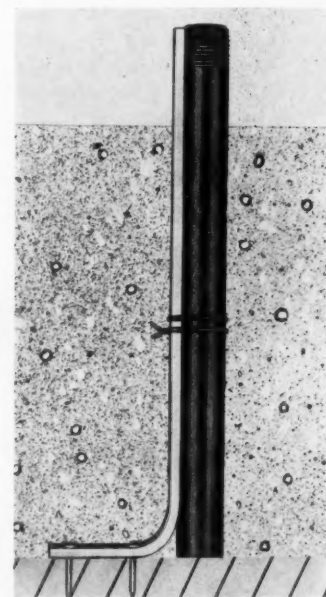


Stake supports pipe during concrete pours

A new steel channel for use in poured concrete floors and walls is being marketed by Industrial Sheet Metal Work.

The Hahn stake has been designed to provide a quick, easy, efficient, and inexpensive method of supporting pipe, conduit, tubing, or cables in exact locations during concrete pouring of floors and walls. The stake is made of 16-gage steel $\frac{1}{2}$ inch wide, and stands 12 inches high. The right-angle support piece is $2\frac{1}{2}$ inches long and contains two holes for nails.

In use, the pipe or whatever is to be supported is set in position, the



channel stake placed upright against the pipe and secured to the deck, and the pipe tied with wire to the stake. Thus, when the concrete is poured, the pipe or conduit will remain in the exact position.

Although Hahn steel channel stakes come in 12-inch lengths, they may be trimmed to accommodate practically any job. They are said to be highly versatile and adaptable for use in supporting tubing at any angle, whether verticle or horizontal.

Industrial Sheet Metal Work, Dept. C&E, 3155 N. Halsted St., Chicago 14, Ill.

Circle No. 77.

For more data on any item, circle indicated number on card at page 18.

For more facts, use coupon or circle No. 486

149

P&H 45 TON TRUCK CRANE

more machine—means more profitable operation

Lifts 45 tons at 15 foot radius, 8 wheels, 4 wheel drive, 12 tires. We were told by many visitors that for them the outstanding attraction at the Road Show was the P&H 575-TC—part of the continuing program of P&H product development creating new standards for truck crane capacity and mobility.

With the P&H 575-TC you get 45 tons of genuine lifting capacity at a practical 15 foot radius with lots of reserve power. Substantial money savings result when you use this versatile P&H truck crane on jobs that formerly were double-lifted by two smaller rigs—or handled by less mobile crawler cranes.

This 8 x 4 (4 axle) Model 575-TC is the strongest 45 ton carrier built. Wide speed selections

and direct, positive, commercial truck-type controls assure easy travel and maneuverability. It has the same turning radius as 3 axle rigs.

P&H provides a single source of responsibility for the upper and the carrier. Both are P&H designed and built expressly for 45 ton needs.

Other P&H features—independent planetary boom lowering—triple safe boom hoist—direct hydraulic controls—live roller circle—lighter yet stronger alloy steel lattice boom are standard equipment on the Model 575-TC.

See your dealer. He will demonstrate these and other profit producing P&H features.

Harnischfeger Corporation
Construction & Mining Division
Milwaukee 46, Wisconsin

THE P&H LINE

Truck Cranes: 8, 10, 15, 20, 25, 30, 35 and 45 tons
Shovels: $\frac{1}{4}$, $\frac{1}{2}$, $1\frac{1}{4}$, $2\frac{1}{2}$, and $3\frac{1}{2}$ yards

Across the country **P&H** machines lead the field in power, speed, flexibility, and profitable performance



TEXAS
For handling loads up to 50 tons profitably there is the P&H 855B-LC. Here is Houston Lighting & Power Company's P&H 855B-LC crane with extra long crawlers shown at work with $2\frac{1}{2}$ yds. dragline—their 4th P&H machine.



NEW YORK
In the 20 ton class, E. G. DeLia & Sons, New Hartford, New York depend on their P&H 255A-TC with 1 yd. clam-shell bucket to hold down cost in pipe laying and backfill work on new road near Gloversville, New York.



WISCONSIN
M A.C. Construction Co., Kenosha, Wisconsin profits from the lively swings and dependable performance of their $\frac{1}{2}$ yard P&H 155A trench hoe. It is shown at work on water pipe project for the city of Burlington, Wisconsin.

Write today
for Bulletin TX-186
on the P&H 575-TC
fully convertible
45 ton Truck Crane

Harnischfeger Corporation, Dept. 515-D
Construction & Mining Division
Milwaukee 46, Wisconsin

Gentlemen:
Please send me Bulletin TX-186 on the 45 ton P&H 575-TC

Name _____
Title _____
Firm _____
Street _____
City _____ Zone _____ State _____



The Dodge W500 4-wheel-drive truck is powered with either a 130-hp 6-cylinder or a 197-hp V-8 engine.

Expand 4-wheel-drive line of truck models

The Dodge Division of the Chrysler Corp. has announced expansion of its 4-wheel-drive truck line with the addition of three new models.

Largest of the Dodge 4-wheel-drive trucks is the new W500. Powered by either a 130-hp 6-cylinder or 197-hp V-8 engine, the W500 has a maximum gvwt rating of 18,000 pounds. This compares with a 113-hp 6-cylinder engine and a maximum gvwt rating of 9,500 pounds in the W300 Power-Wagon, the company's older 4-wheel-drive model.

The other two units in the expanded 4-wheel-drive line are smaller in wheelbase and carrying capacity.

They are offered with either a 120-hp 6-cylinder engine or a 204-hp V-8 engine. One is the W100, with a maximum gvwt rating of 5,100 pounds. The other is the W200 with a maximum gvwt rating of 8,000 pounds.

The W100 is offered in 108 and 116-inch wheelbases; the W200 has a 116-inch wheelbase; the W300 has a 126-inch wheelbase; and the W500 is offered in 156 and 174-inch wheelbases.

The front-mounted power winch on the two larger models has 10,000-pound pulling and hoisting capacity, and comes with 250 feet of 7/16-inch cable. Capacity of the power winch available on the smaller models is 8,000 pounds.

While the 4-wheel-drive trucks may be placed in 2-wheel-drive for normal highway travel, they are designed chiefly for many off-the-highway uses and for travel with loads through loose sands, hub-deep mud, and snow.

Dodge offers the 4-wheel-drive trucks in a wide variety of body styles and with many options in transmissions, springs, tires, and other component parts. Body styles include chassis and cab, chassis and flat-face cowl, pick-up, platforms, stakes, and the Town Wagon station wagon body which carries as many as eight passengers.

Power take-off assemblies are available in all models for auxiliary power equipment. Thus the trucks use engine power to run belt-driven saws, pumps, sprayers, mixers, and many other types of machinery.

Dodge Division, Chrysler Corp., Dept. C&E, 7900 Jos. Campeau, Detroit 31, Mich.

Circle No. 168.

Self-powered scraper works in tight quarters

A new scraper said to incorporate many innovations in design and construction is now in production by The Oliver Corp. The new machine is the Model 990.

A 6.7-cubic-yard-capacity rig, the scraper is said to combine speed, maneuverability, and small size, enabling it to work quickly and efficiently in congested areas, excavations, and other confined places.

The new scraper is powered by a GM 3-cylinder diesel of 77.4 drawbar horsepower with 6-speed transmission. Torque converter is also available as optional equipment. The machine has power for maximum working ability with low operating costs, the company claims.

The unit has all-hydraulic design, said to guarantee smooth, responsive, positive steering and scraper operation, even in loose or sloping ground. Offset cutting with curved bowl arrangement reportedly results in rapid loading, while hydraulic pressure ejection provides a fast unloading cycle. Sharp turns and close-quarter working ease are said to result from its steering maneuverability.

While compact in size—width is

You asked for
MORE FOOTAGE!
MORE SPEED!
LONGER BLADE LIFE!

You get them all in
the new **FELKER**

di-lock

concrete cutting diamond blade!



Now you can get greater economy, better overall performance in new Felker Di-Lock Segmented Diamond Blades! Here's the fastest cutting, longest lasting diamond blade yet developed and it's cutting costs on concrete cutting jobs across the nation!

TOTALLY NEW, the DI-LOCK is made by a completely different manufacturing technique. It grips its diamonds tighter than ever... holds them against severest shock and impact, keeps blades cutting for foot after foot after others give up!

MAKE THE DI-LOCK TEST! Try DI-LOCKS on your very next concrete cutting job... compare the difference... you'll like this new kind of economy and efficiency! Order DI-LOCKS from your Felker Distributor or wire direct.

Model 257, 25 hp. Felker Concrete Cutter illustrated. Other models available from 7½ to 36 hp.

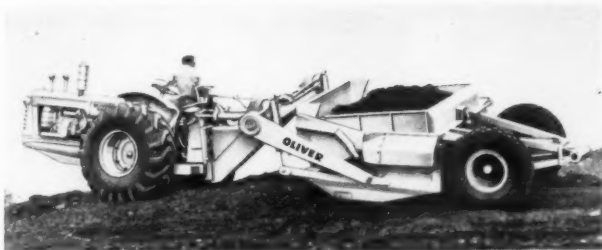


**FELKER
MANUFACTURING CO.**

Torrance, California

First in Diamond Cut-Off Blades!

For more facts, use Request Card at page 19 and circle No. 457



only 8½ feet—the scraper has ample road speeds to perform a number of cut-and-fill jobs speedily and to be easily moved from one job location to another.

The Oliver Corp., Industrial Division, Dept. C&E, 400 W. Madison St., Chicago 6, Ill.

Oliver's Model 990 scraper is said to be a highly maneuverable unit.

Circle No. 171.

Improved ditching unit has three new features

Production of an improved Gar Wood-Buckeye Model 403 utility ditcher that incorporates foot-pedal steering, a shiftable spoil conveyor, and new hydraulic controls has been announced by Gar Wood Industries, Inc.

Specially designed for "stop-and-go" utility ditching, the compact Model 403 is equipped with a new hydraulic pump said to provide full-time hydraulic pressure for instant control of the digging boom. The new system eliminates the need for a hoist-clutch, while at the same time reducing the number of moving parts, according to the company.

A new foot-pedal steering arrangement on the ditcher replaces hand levers, providing the operator with greater control and accuracy. An exclusive slip-clutch on the new model automatically protects the machine from overloads. No tools or complicated adjustments are required to shift the spoil conveyor to right or left. The operator can easily move the conveyor by hand to either side of the machine, the company reports.

The Model 403 has a maximum digging capacity of 5 feet deep and 12 inches wide, or 4 feet deep and 16 inches wide.

Gar Wood Industries, Inc., Dept. C&E, 36253 Michigan Ave., Wayne, Mich.

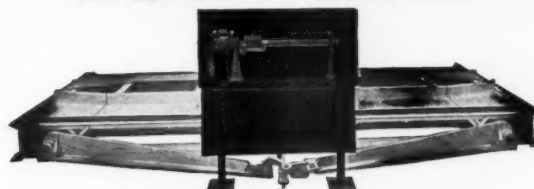
Circle No. 40.



The improved Gar Wood-Buckeye Model 403 utility ditcher has foot-pedal steering among its new features.

WINSLOW—PORTABLE TRUCK SCALE

"THE CONTRACTORS' SPECIAL SCALE"



For use at temporary and permanent locations—at stock piles and by bituminous material contractors at the job site. Cap.: 15-18-20-30, 50 tons. Write us for name of your nearest distributor

WINSLOW SCALE COMPANY

P. O. Box 1198
Terre Haute, Indiana

For more facts, use Request Card at page 18 and circle No. 488



Cleveland 140 digs through rocky New Hampshire hills

"...exceeds wildest expectations"

"We got trench with our Clevelands where we thought it would be impossible," says H. J. Burns of Hallen Construction Co., Island Park, N. Y., about a recently completed pipeline job for the Granite State Transmission Co., between Exeter and Somersworth in the rugged New Hampshire hills. The Hallen spread cut through numerous swamps and terrain strewn with boulders and choked with frequent outcroppings of rock.

"Our Cleveland 140 cut 24 miles of our 30-mile section—dug everything except the deepest swamps and solid ledge rock. It dug through shale and even handled boulders up to 6 and 8 cubic feet. Even in the toughest going the 140 never fell below 1,700 feet of trench per day and averaged 2,200 feet per day for the whole job."



THE CLEVELAND TRENCHER COMPANY

20100 ST. CLAIR AVENUE • CLEVELAND 17, OHIO

For more facts, use Request Card at page 18 and circle No. 489

Product Parade

Material-handling tools for front-end loader

Two attachments, a pallet fork and a pulp wood clamp fork, have been designed to interchange with the bucket and increase the versatility of Ottawa industrial front end loaders.

The pallet fork attachment is used for handling all palletized materials such as concrete blocks, brick, lumber, building materials, and pipe. Held by the same four pins which normally carry the bucket, it can be interchanged with the bucket in 15 minutes' time, according to the manufacturer. The pallet fork attachment is equipped with a rear guard to prevent the load from rolling over the back of the carriage, and has a

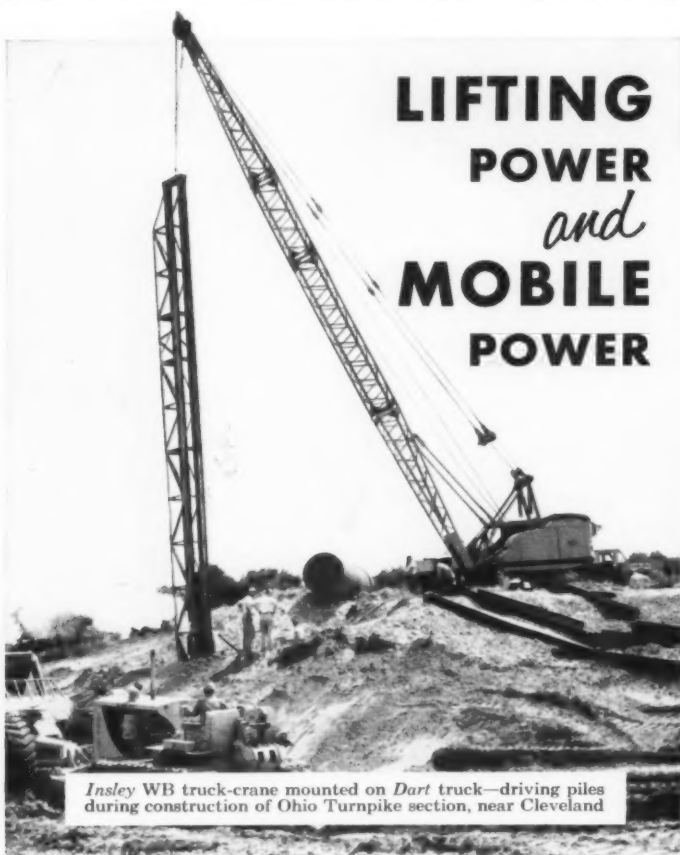
tilt-back angle of 18 degrees, with a full dump angle of 40 degrees.

The pulp wood clamp fork is used to load, transport, and stack lumber or any material requiring a hold-down device. The hydraulically controlled clamp prevents loss of load when traveling over rough terrain.

Pallet forks and pulp wood clamp forks are available in 30, 36, 42, 48, and 54-inch lengths, and carriage widths of 48 and 64 inches.

Ottawa Steel Division, L. A. Young Spring & Wire Corp., Dept. C&E, Fifth and Main Streets, Ottawa, Kan.

Circle No. 114.



Insley WB truck-crane mounted on Dart truck—driving piles during construction of Ohio Turnpike section, near Cleveland

BOTH Crane and Truck have WAUKESHA ENGINES



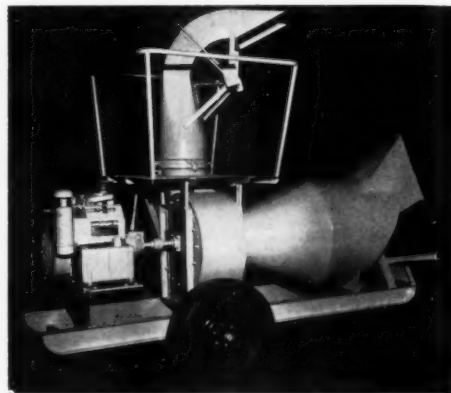
POWERING CRANE (Boom)
Waukesha 140-GK Gasoline—6-cyl.,
4 1/2 x 5 1/2-in., 525 cu. in., 160 hp @ 2250
rpm. Send for descriptive bulletin 1548.



POWERING TRUCK (Carrier)
Waukesha 145-GK Gasoline—6-cyl.,
5 1/4 x 6-in., 779 cu. in., 216 hp @ 2000
rpm. Send for descriptive bulletin 1551.

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN
NEW YORK TULSA LOS ANGELES

For more facts, use Request Card at page 18 and circle No. 490



The Reinco mulcher has a reported maximum spreading capacity of 90 bales per hour.

High-speed mulcher for roadside work

Development of a new high-speed mulching unit has been announced by the Reinco Engineering & Mfg. Co.

According to the company, the Model 7M30 mulcher utilizes no accessory devices or "power-robbing" belt drives, consequently full engine power is available for operations.

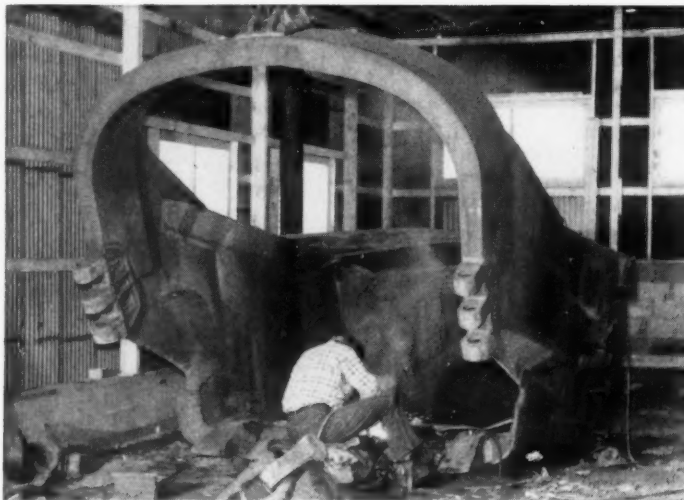
Several unique features are said to be incorporated in the unit. A combination of belts breaks bales of hay introduced through the loading chute at a maximum rate without causing the hay to shred. The advantage here reportedly lies in even, constant

distribution of discharged hay without lumping and fan slowdown, thus giving maximum coverage to seeded areas.

Interchangeable spouts are available to vary throw up to a maximum of 150 feet. Depending on hay or straw composition, a maximum of 90 bales per hour may be effectively spread for cover.

Reinco Engineering & Mfg. Co., Dept. 106 Grandview Ave., North Plainfield, N. J.

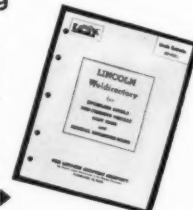
Circle No. 173.



How to make dragline buckets LAST 3 TIMES LONGER with hardsurfacing

This 9 cubic yard dragline bucket costs \$10,000. Normal life is one year, but periodic hardsurfacing with Lincoln Faceweld-12 chromium-carbide type electrodes has kept this bucket in service for over 3 years.

This is typical of the service you get from Lincoln hardsurfacing, whatever your needs may be. Write for Weldirectory SB-1352 for data on the complete hardsurfacing line.



THE LINCOLN ELECTRIC COMPANY

Dept. 5315, Cleveland 17, Ohio
The World's Largest Manufacturer of Arc Welding Equipment

When
Lincoln
Faceweld

Has best
abrasion
service

Yet
costs
less

WHY
use anything but
Lincoln?

For more facts, use Request Card at page 18 and circle No. 491

CONTRACTORS AND ENGINEERS



The Miller Mono-Form MC-100 Curbuilder automatically extrudes and compacts asphalt curbing.

One-man operated machine extrudes asphalt curbing

A one-man operated machine which extrudes and compacts asphalt curbing is available from The Miller Spreader Corp. The Curbuilder is offered in two models: the Twin-Form MC-200 with two compaction chambers, and the Mono-Form MC-100 with one compaction chamber.

The operator rides on the self-propelled machine and steers it around curves with a tiller. The machine will place curbing at the extreme edge of a pavement or within one inch of a wall or other obstruction. Compaction ranges between 90 and

110 per cent, the company reports.

Five standard curb form designs are available for use with the Curbuilder. Special forms can be fabricated to specifications. The Twin-Form MC-200 paves both left and right and may be loaded from either side of the hopper. Both models work equally as well up hill or down hill as they do on level ground.

The Miller Spreader Corp., Dept. C&E, 4020 Simon Road, Youngstown, Ohio.

Circle No. 133.

Draftsman's tracing paper is resin-transparentized

A new resin-transparentized, 100 per cent rag content tracing paper called Visi-Vel is offered by the Charles Bruning Co., Inc. Unusually good translucency, workability, permanence, and uniformity are claimed for the paper.

This new paper is said to boost print production as much as 25 per cent over other transparentized papers. In visual characteristics, Visi-Vel reportedly provides a perfect balance of visual opacity and transpar-

ency to assure easy, comfortable visibility of drawing surface and line when making original drawings and excellent visibility of underlying image when making tracings.

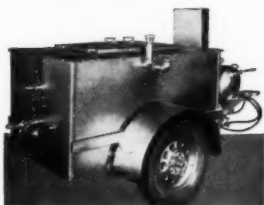
Drawings made on this paper can be filed indefinitely without deterioration of the drawing. This paper will not become brittle or discolor.

Charles Bruning Co., Dept. C&E, 4700 Montrose Ave., Chicago 41, Ill.

Circle No. 75.

White HEATING KETTLES

FOR SAFER MELTING
OF BITUMINOUS
MATERIALS



Tool Heaters
Surface Heaters
Special F-10 Compound
Kettle
Torches and Burners



Capacities from 80 to 325 gallons. All equipped with *exclusive* FIRE PROOF TOP (hinged tops available for roofing use). Operator and equipment are *protected* from flash fires. Complete line of accessories optional. Choice of kerosene and propane burners.

White MANUFACTURING COMPANY

ELKHART 9, INDIANA

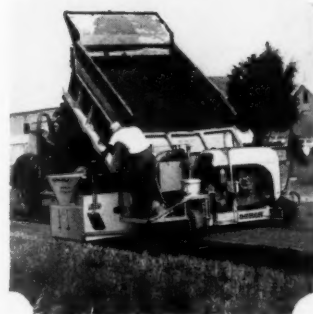
For more facts, use Request Card at page 18 and circle No. 492

BURCH ROAD WIDENER

(PATENTS PENDING)

- One-man control.
- For 2 ft. to 4 ft. standard widening.
- 4-speed conveyor belt.
- Will empty its hopper as fast as you can fill it.
- Equipped with BURCH exclusive truck coupler and special BURCH adjustable truck hitch.
- Applicable to any standard dump truck.
- No blocking of highways—right-hand lane always open for traffic.

Write Dept. CE for literature.

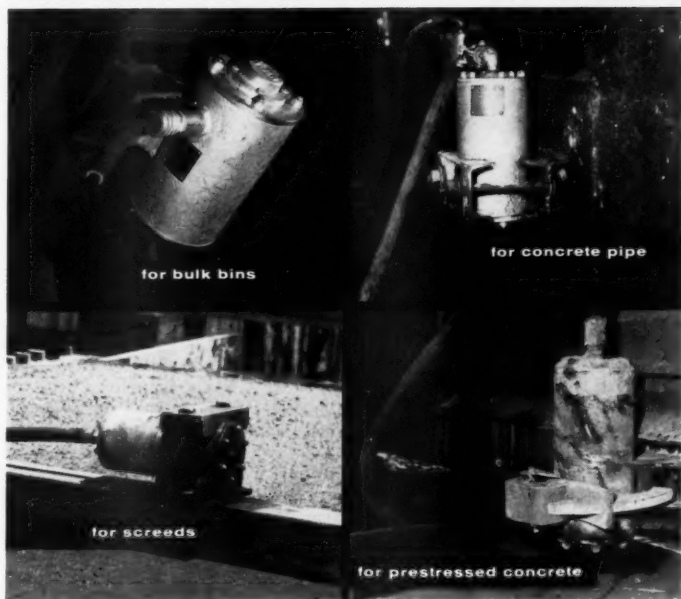


The BURCH Road Widener is attachable to any truck. Built-in conveyor, which is driven by heavy industrial gas motor, will deliver material where required. It will handle sand, gravel, stone, or bituminous material. Self-propelled and steered by hydraulic equipment. A high-speed unit unexcelled in road construction.

The BURCH Corporation
CRESTLINE, OHIO, U.S.A.
MANUFACTURERS OF EQUIPMENT
FOR CONSTRUCTION AND MAINTENANCE
OF ROADS AND STREETS

For more facts, use Request Card at page 18 and circle No. 493

Most Effective Vibration



Viber External Vibrators

Wherever reusable steel forms are set up on a production basis—in concrete pipe production, in the precasting of prestressed girders, beams, roof and wall sections, and in cast-in-place operations such as tunnel lining—VIBER external vibrators offer the dual benefits of reduced cost and improved quality.

In concrete placing, VIBER high speed, low amplitude external vibration increases production, improves quality, promotes economy, reduces absorption and permeability, and strengthens the bond between concrete and concrete, or concrete and steel. This high speed and low amplitude also minimizes the possibilities of damage to expensive forms.

In bulk materials handling, VIBER external vibration speeds the flow of all materials, from the finest powders to large solid pieces—during loading or unloading; while moving through

chutes, bins, hoppers or pipes; when measuring, packaging or sorting.

High speed, low amplitude external vibration, pioneered and perfected by the VIBER Company, offers many advantages in concrete placement or bulk materials handling. VIBER vibrators have been proved by hundreds of laboratory and field tests and the practical experience of cement associations, highway departments, contractors, concrete product manufacturers and others.

Seven models of VIBER external vibrators meet an unlimited variety of applications; they are designed for permanent or temporary mounting; speed and amplitude may be regulated; pneumatic or electric power may be used.

Write today for illustrated literature and factual information for solving your vibration problems. Viber Company, 726 South Flower St., Burbank 20, California.



VIBRATORS

Pioneers and leaders in the manufacture of vibrators.

For more facts, use Request Card at page 18 and circle No. 494



Offering greater horsepower and faster laying speeds, this Barber-Greene Model 879-B finisher also features improved crawler design, faster tamper action, and other advantages.

Crawler-type finisher with major improvements

The Barber-Greene Co. has announced a new crawler-mounted asphalt paver said to embody new features giving it faster laying speed, faster travel, lower maintenance cost, and increased power.

These improvements, developed from experience in laying all types of mix under varying conditions, are incorporated in the new Model 879-B finisher:

1. A new transmission which provides both higher operating and higher travel speeds. The new transmission will provide 12 forward

speeds. The maximum operating speed has been increased to 64 fpm and the travel speed to 3 3/4 mph.

2. A new high-speed tamper said to permit faster laying speeds and reduced maintenance costs.

3. New crawlers featuring precision-drilled pads and larger pins, offering still further reduction in maintenance costs.

4. A new power unit providing 20 per cent more power. This permits pushing even bigger trucks and handling even steeper grades, and gives a greater reserve of power for high-altitude operation, as well as making possible higher operating speeds, according to the manufacturer.

The company also announced that these improvements can be incorporated into older Model 870-A Barber-Greene machines. The necessary parts are now available in kit form, for field conversion, with each modification handled separately.

Barber-Greene Co., Dept. C&E, 400 N. Highland Ave., Aurora, Ill.

Circle No. 95.

Herbicide controls weed growth along roadside

A new herbicide which has been widely tested both in this country and in Europe is being offered by Geigy Agricultural Chemicals as an effective weed-control agent for use on roadsides and other non-cropped areas.

The herbicide, called Simazin, shows maximum activity on germinating weeds and should be applied just before or during germination or emergence for best results, according to the company.

When applied at a rate of 10 pounds per acre prior to weed emergence, Geigy Simazin 50W reportedly will prevent growth for about one year of a wide variety of grasses and broad-leaf weeds.

Simazin is said to be relatively non-toxic to humans and domestic animals, non-corrosive, and can be removed from spray equipment by merely washing the equipment thoroughly with water. The low solubility of Simazin causes it to remain in the upper layers of soil with a minimum of leaching. Because there is no lateral leaching, Simazin can be used adjacent to cropped areas with no danger of injuring the crop. In addition, the lack of phytotoxicity to foliage is said to minimize the drift hazard which accompanies many herbicides.

The herbicide comes as a wettable powder containing 50 per cent active ingredient.

Geigy Agricultural Chemicals, Division of Geigy Chemical Corp., Dept. C&E, P. O. Box 430, Yonkers, N. Y.

Circle No. 61.

For more facts on these products, circle the indicated number on the Request Card at page 18.

CONTRACTORS AND ENGINEERS

These jobs profited from Bucyrus-Erie Cranes... yours can too!



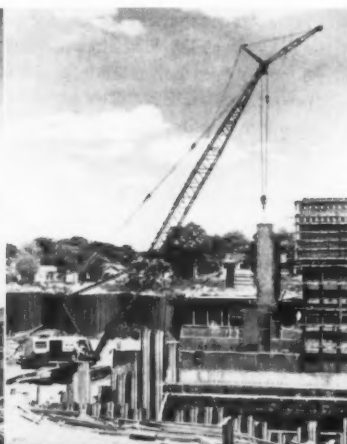
DENVER, COLO. Tractor-type crawlers provide extra clearance for passing over rocks, boulders, etc. Deep grousers provide sure footing for maneuvering on mountainous terrain. This Bucyrus-Erie 22-B reaches out with a 50-ft. boom and accurately pours its 1-yd. bucket of concrete in the construction of a guided missile plant near Denver.

PASADENA, CALIF. High lifts in erecting a steel bridge are handled by this Bucyrus-Erie team—an 88-B equipped with a 160-ft. boom-jib combination and a 38-B with 110-ft. boom-jib combination. Users recognize Bonus Quality in the balanced performance and daily dependability of Bucyrus-Eries.

COLUMBUS, OHIO. Handling structural steel is one of a variety of light- and heavy-duty lifting jobs assigned to this Bucyrus-Erie 51-B in the construction of a hospital. You'll find all the essentials of profitable crane service in Bucyrus-Eries—speed, power, smooth operation, long reach, stability, and low cost maintenance.

LOUISVILLE, KY. This Bucyrus-Erie 54-B takes full advantage of its stability and 100-ft. boom in placing steel plate during the construction of a pumping station for flood control. The crane is also used here for clamshell service and is also convertible to dragline, dragshovel, or shovel.

DETROIT, MICH. Rugged 24-hr. service on tough tunnel excavation work in storm sewer construction is a natural for this sturdily-built, steady-working Bucyrus-Erie 38-B. It is removing a mud-box filled with muck from the tunnel shaft.



For more facts, use Request Card at page 18 and circle No. 495

155



The M-R-S Model 200 tractor, a 335-hp unit, is now available with 4-wheel drive.

Heavy-duty tractor sports 4-wheel-drive

The M-R-S Mfg. Co. has announced the availability of a 4-wheel-drive version of the 335-hp M-R-S model 200 tractor. Designed for hauling over pioneer-type terrain, the driving front axle is said to combine a high degree of mobility with the great traction made possible by hydraulic weight transfer for negotiating extremely rough or spongy hauling surfaces.

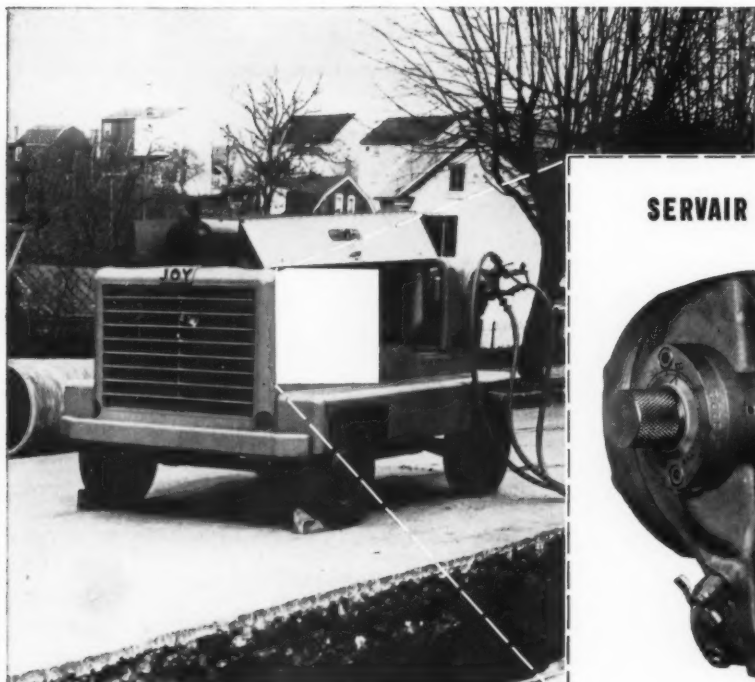
With ample power, a static weight of 45,000 pounds, and large, low-pressure tires, the big tractor reportedly is capable of providing up to 38,000 pounds available tractive effort. An

optional differential ratio is offered providing a maximum available tractive effort of 44,100 pounds. A semi-automatic transmission is employed, giving the tractor nine forward and two reverse speeds, with maximum forward speed of 35.18 mph.

The M-R-S model 200 4-wheel-drive tractor is recommended as a prime mover to self-load scrapers of up to 20 cubic yards struck capacity and for powering scrapers of up to 30 cubic yards struck, 39 cubic yards heaped capacity when loaded with pusher assistance.

M-R-S Mfg. Co., Dept. C&E, Flora, Miss.

Circle No. 219



SERVAIR DEMAND CONTROL



ONLY JOY AIRVANE PORTABLE COMPRESSORS HAVE THIS NEW FOOL-PROOF LOAD CONTROL

The new Servair Demand Control takes the mystery out of pressure setting . . . makes it as simple as turning up the furnace thermostat at home. You just set the dial for the pressure you need and the Joy Airvane Rotary will deliver it.

The Servair is a true "demand" load control because it matches compressor output to demand . . . from 0% to 100% capacity. The control maintains steady air pressure regardless of the number and size of tools cutting in and out during operation, yet runs the engine only fast enough to meet the demand for air. This gives you top fuel economy and a minimum of wear and tear on the engine and compressor.

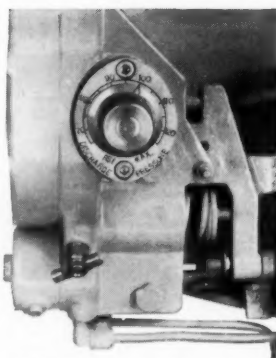
Joy Airvane Rotaries have many other features that make them trouble-free:

THERMAL BY-PASS—an exclusive oil circulating system that provides immediate lubrication and temperature control under all weather conditions.

DIRECT DRIVE—efficient spline coupling eliminates clutch (and clutch maintenance).

READY ACCESSIBILITY—to controls and items normally requiring regular maintenance.

You should get the whole story on Joy Airvane Portables before you consider any new compressor. Write **Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.** In Canada: **Joy Manufacturing Company (Canada) Limited, Galt, Ontario.**



"JUST SET THE DIAL FOR THE PRESSURE YOU NEED"

JOY . . . EQUIPMENT FOR CONSTRUCTION . . . FOR ALL INDUSTRY



WRITE FOR
FREE BULLETIN
181-21



Portable Air
Compressors



Wagon
Drills



Rock
Bits



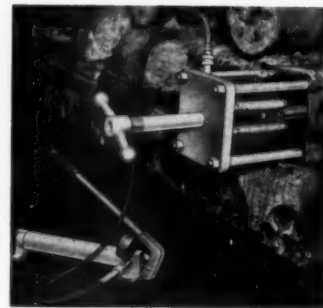
Hand-Held
Rock Drills

For more facts, use Request Card at page 18 and circle No. 498

Pivot-shaft remover for twin-engine rig

A simple means of "splitting" the Euclid TC-12 twin-engine tractor into halves for easier transporting has been developed by the Owatonna Tool Co. The process involves pushing the pivot shaft out of its housing by hydraulic power.

A new unit called the OTC Y-712A pivot-shaft removing tool utilizes an



Owatonna's Y-712A pivot-shaft removing tool easily "splits" the Euclid TC-12 twin-engine tractor.

OTC-50-ton Power-Twin ram and forcing screw to do the job.

By removing the cover plate, retainer caps, and other retaining parts, mounting the tool in existing cover bolt holes, and applying pressure, the job of splitting the big tractor for over-the-road transportation is accomplished in a fraction of the time normally required, according to the manufacturer.

The complete Y-712A unit includes an OTC-50-ton hydraulic Power-Twin ram and pump, plus four legs, head, and nuts. If the user already has the ram and pump, only the accessories are needed.

Owatonna Tool Co., Dept. C&E, 381 Cedar St., Owatonna, Minn.

Circle No. 80.

Simplified assembly of steel buildings

A new development in steel building assembly said to result in appreciable savings in both construction time and costs has been introduced by the Steelcraft Mfg. Co.

The development involves an em-

CONTRACTORS AND ENGINEERS



bossed-hole fastening system which makes it possible for only one man working on the outside to install roof and wall sheets on Steelcraft steel buildings. With this system, the company claims, automatic and uniform location of fastenings is assured.

With the new fastening method, an impression is formed on the outside of the wall or roof panel by striking a mallet over a pre-punched extruded hole in the grit or purlin. Once this impression is made, the proper screw location is immediately determined without the necessity of scaffold work from the inside.

After the screw location is found, a hole is punched in the spot marked by the impression in the roof or wall panel. When a sheet metal screw with neoprene washer is applied, the extruded hole provides a raised area which fits tight against the washer, assuring a weather-tight seal.

In addition to costs saved through the elimination of inside scaffolding, construction time is also reduced, since the sheeting can be placed and screws applied by one man.

Steelcraft Mfg. Co., Dept. C&E, 9017 Blue Ash Road, Rossmyrne, Ohio.

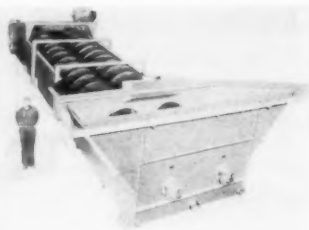
Circle No. 48.

Eagle Iron Works' new 54-inch-screw-diameter washer-classifier-dehydrator for sand processing.

Fines-processing units in 54-inch screw models

To meet the ever-increasing demands for fine-material washer-classifier-dehydrators in larger capacities, Eagle Iron Works has introduced a new, large unit in both single and double-screw models.

Screw diameter is 54 inches and tub length is 34 feet. Normal screw speed is 14 rpm. Capacity of the single screw is 250 tons per hour, and for the double screw, 500 tons per hour.



The construction of this unit is, in general, the same as for the smaller Eagle units, although shafts, bearings, and drive are heavier. The screw is of the ribbon type, consisting of a sheet steel spiral welded to the shaft with replaceable Ni-Hard chrome-nickel alloy iron shoes on the wear-

ing edge of the screw.

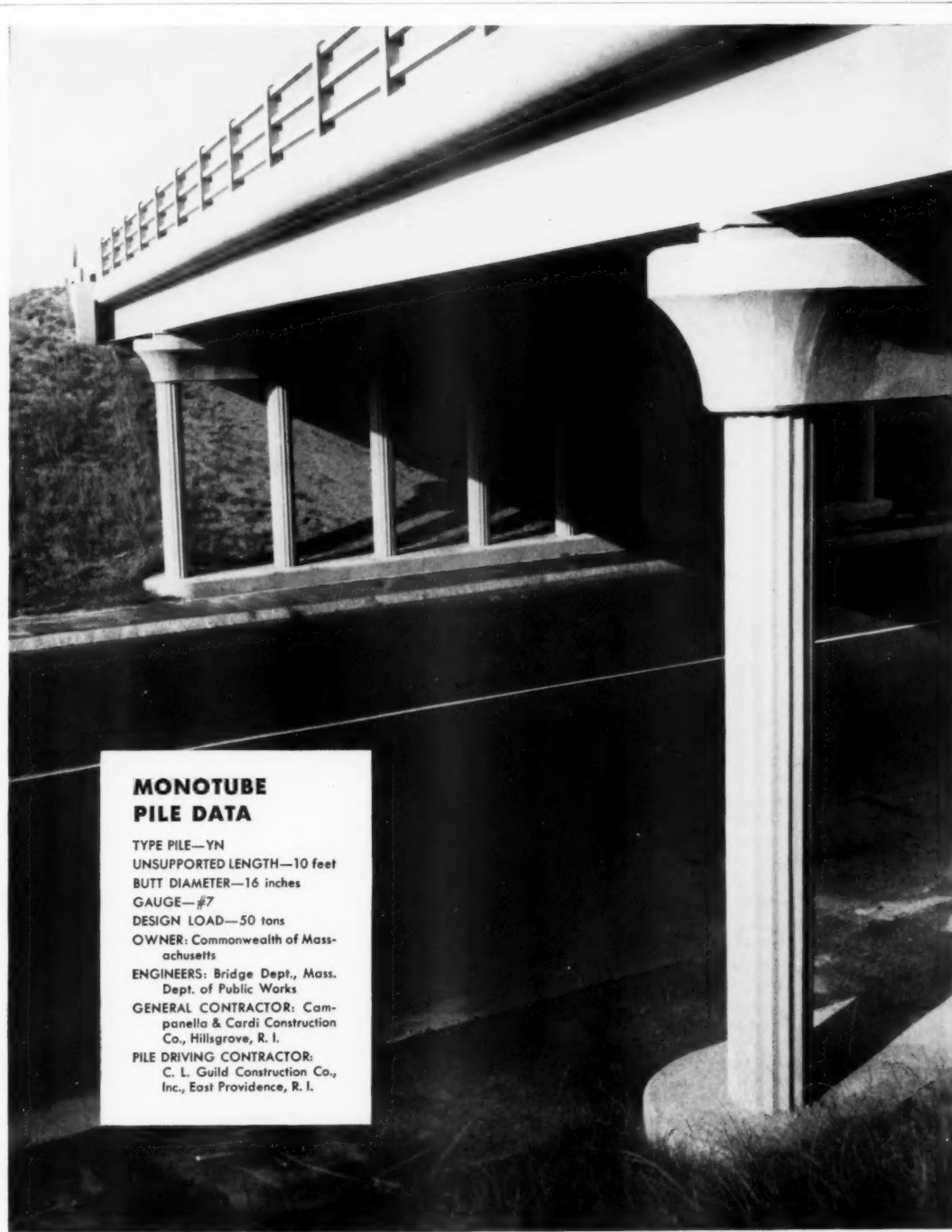
An important feature is an improved feed box which will become standard on all Eagle fine material screws. It is designed to reduce turbulence to a minimum in the settling pool area.

The single screw weighs 26,000 pounds, and the double screw 50,000 pounds.

Eagle Iron Works, Dept. C&E, Box 934, Des Moines, Iowa.

Circle No. 116.

For further information on any product described in this section, circle the indicated number on the Request Card at page 18 of this issue.



MONOTUBE PILE DATA

TYPE PILE—YN
UNSUPPORTED LENGTH—10 feet
BUTT DIAMETER—16 inches
GAUGE—#7
DESIGN LOAD—50 tons
OWNER: Commonwealth of Massachusetts
ENGINEERS: Bridge Dept., Mass. Dept. of Public Works
GENERAL CONTRACTOR: Campanella & Card Construction Co., Hills Grove, R. I.
PILE DRIVING CONTRACTOR: C. L. Guild Construction Co., Inc., East Providence, R. I.

STRENGTH plus VERSATILITY with Monotube piles... a perfect combination for this bridge on the Mid-Cape Highway, Dennis, Mass. Acting as columns, as well as foundations, Monotube steel piles provide necessary strength, eliminate column form-work and add to architectural beauty.

Tapered, fluted Monotube piles are available in lengths, diameters and gauges to meet every requirement. Write The Union Metal Manufacturing Co., Canton 5, Ohio, for complete information.

UNION METAL
Monotube Foundation Piles

For more facts, use Request Card at page 18 and circle No. 500

SAVE MONEY SEND US YOUR ORDERS FOR ROTARY SWEEPERS NEW BROOM CORES

Do You Know We Manufacture NEW
Cores of the Following Types:

- Grace (3 types)
- Hough
- M-B (Mell-Blumberg)
- Detroit-Harvester
- Fordson
- Boro
- Little Giant
- Huber
- Lull
- Spearswell

and other popular makes

YES! We Can Make Cores to

Your Specifications

We Rebuild—Repair—Re-
fill All Makes and Sizes of
Broom Cores.

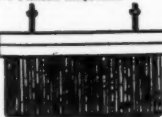
Immediate Shipment

**SUGGESTION—To Far-Away Users—Buy your
NEW Cores only without any filling or we will
furnish complete Palmyra-Hickory or Bass Fibres
—Even Steel Wires.**

Road Builders—It's Sensational!!
BIG PECKERWOOD BIG
C-O-N-T-I-N-U-O-U-S
Steel Wire Road Drag Leveler. Six (6) Inches Wide
—Name Your Length

Not STAPLE set
In Stock Lengths of 4-6-8-10 or 12 feet
Only \$3.50 Foot "Approx. wt. 5 1/2 lbs. per ft."

NO FRAME REQUIRED



**The LITTLE
PECKERWOOD**
3" Wide, 15" Length
This Fits Your Frame
**NOTE—Both Drags
Can Be Furnished
with Fibre.
Only \$2.50 Ea.**

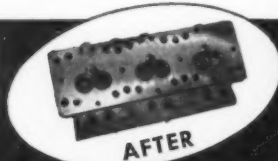
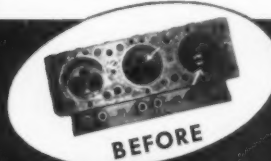
KENNEDY'S

SINCE VAN BRUSH MFG. CO., INC. 1928
327 Southwest Blvd., Kansas City, Mo.

For more facts, circle No. 499

DON'T THROW AWAY CRACKED DIESEL CYLINDER HEADS

You can save 50% of replacement cost with Factory Rebuilt Guth Company Heads. The Guth Company restores cracked or worn heads, blocks, transmission cases to a Guaranteed good-as-new condition by the Guth fusion process . . . successfully used for more than a Quarter Century.



Send today for price list and a free booklet on the famous Guth Fusion Process, and the name of the dealer nearest you.

GUTH COMPANY

McPHERSON, KANSAS

SERVING THE NATION

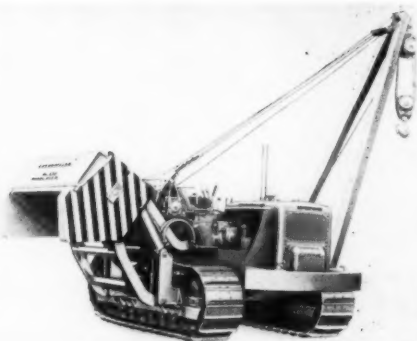


FROM ITS CENTER

For more facts, use Request Card at page 18 and circle No. 502

Product Parade

The new Caterpillar No. 572 pipelayer has a rated lifting capacity of 86,000 pounds and is powered by a Caterpillar diesel developing 128 horsepower at 1,200 rpm.



New pipelayer rated at 86,000 pounds

A new medium-size pipelayer designed to combine lifting power with sure stability has been announced by Caterpillar Tractor Co. Designated the No. 572 pipelayer, the new machine offers 86,000 pounds of lifting capacity at 4 feet overhang and an 86-inch track gage for dependable footing. Ground clearance of 19 inches is said to assure maximum maneuverability in any terrain.

The machine's design includes the integrated unit construction of the tractor chassis and pipelayer mechanism. Further weight-carrying ability is provided by the extra-heavy-duty track rollers—six on each side—having large-diameter bearings and shafts. A large sprocket, designed especially for pipelayer work, has also been incorporated. Hydraulic track adjusters permit quick adjustment of track tension with a standard grease gun.

Power for the No. 572 pipelayer is developed by a 4-cylinder Caterpillar diesel engine, rated at 128 horsepower at 1,200 rpm. The engine transmits power to a three-stage torque converter, which is coupled with a special low-speed transmission having three forward and two reverse speeds. In-seat starting is provided by an independent 2-cylinder, 4-stroke-cycle gasoline engine, with 6-volt electric starter.

Constant, full power is supplied to the boom and load lines whenever the engine is running. Power for the pipelayer winches comes from a live-shaft, constant-power takeoff direct from the engine, independent of the torque converter and flywheel clutch. The pipelayer winch has its own clutch and transmission.

The boom drum has eight ratchet teeth which can be engaged by a pawl to prevent accidental dropping of the boom. An interlock with the transmission of the winch prevents power lowering of the boom when the pawl is engaged. As an additional safety feature, the boom brake is spring-loaded, and requires an overriding effort against the spring for its release.

The counterweight design of the No. 572 is also entirely new. For maximum stability under load, the weights extend in line, but retract over the tracks for increased steering ease when the hook is not loaded.

The rear of the new pipelayer has

CONTRACTORS AND ENGINEERS



Fast operation of body hoist is provided by a trailer-mounted 15 hp, air-cooled engine driving a Galion hi-volume pump through an integral gear reduction unit. Electric starting optional.

use any tractor with GALION SELF-POWERED TRAILER DUMPS for materials hauling in mixed fleets!

With Galion Model STM (SP) self-powered trailer dumps, there's no need to equip your tractors with hydraulic hoist powering systems! You'll minimize tractor dispatching problems . . . reduce equipment investment . . . use leased tractors at will . . . avoid tie-ups due to tractor break-downs!

Self-powered trailers are ideal for shuttle operations, too. The loaded trailer, dropped by the tractor, is dumped as required while the tractor returns an empty trailer for reloading!

The trailer power unit . . . engine . . . pump . . . control valve . . . oil reservoir . . . is completely self-contained. Best of all, the cost is low!

Interested? Ask your Galion distributor to show you how self-powered trailers can

simplify dispatching . . . cut equipment and operating costs . . . increase profits in your fleet!

AA-8629



Trailer power unit has plenty of reserve capacity—handles "tag-along" hoists in train operations with ease.

GALION ALLSTEEL BODY COMPANY • Galion, Ohio

Distributors in principal cities

For more facts, use Request Card at page 18 and circle No. 503

been left clear to facilitate drawbar work. Fifteen positions are available on the unit's swinging drawbar. This provides the needed versatility to work with any type of towed or rear-mounted equipment.

Caterpillar Tractor Co., Dept. C&E, Peoria, Ill.

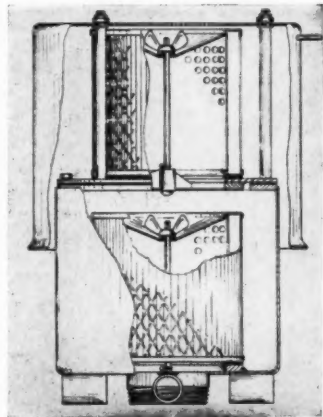
Circle No. 76.

Heavy-duty air filter available for equipment

A new heavy-duty air filter said to permit uninterrupted operation of construction machinery in dust-laden atmospheres and at the same time to extend the useful life of such equipment has been developed by Purolator Products, Inc.

The new filter, for use on tractors, scrapers, rock drills, sand blasters, cranes, crushers, and pneumatic drill equipment, reportedly has proved 99.5 per cent efficient in protecting compressors and engines from wear, thus cutting costly downtime significantly.

Making use of a pair of heavy-duty elements in series, each containing 4,800 square inches of filtering area, the Purolator air filter's positive ac-



tion keeps abrasive particles of all sizes from delicate wear parts. The first stage element has resulted in uninterrupted operations of up to 400 hours, with the only necessary servicing being a daily air-washing and rapping for cleaning purposes.

Available in 100, 200, 400, 600, and 900-cfm capacities, the new heavy-duty air filters allow equipment to remain in operation during servicing of the first stage element due to the efficiency of the second stage element, which provides positive filtration while element number one is being air-washed and rapped for cleaning.

Housings of the new filter unit are constructed of heavy-gage steel, while the elements, which weigh nine pounds apiece, are made of convoluted, resin-impregnated cellulose with 3/32-inch steel base and cover. An expanded metal protective body of 3/32-inch steel shields the element from damage during rough handling.

Purolator Products, Inc., Dept. C&E, 970 New Brunswick Ave., Rahway, N. J.

Circle No. 81.

New lightweight block reported shatterproof

A new heavy-duty rigger-slusher block is now available from Sauerman Bros. This new addition to the line of Durolite blocks is lighter than comparable blocks, and is said to be practically shatterproof. Made of high-quality alloy steel, it is reported to withstand 14-ton dead loads without damage. Wide flange permits use of up to and including 3/4-inch wire rope.

The block reportedly has wide applications for rigging work and in the construction field generally because of its toughness and light weight. A cast bead on the housing



keeps the rope in the groove, even when the block is working in a horizontal position. Quick opening design permits easy handling in cramped quarters. Roller bearings are sealed against dust and dirt and the large grease chambers require infrequent lubrication.

The new rigger-slusher block weighs only 44 pounds, and is available with roller or bronze bearings. Sheave diameter is 10 inches and over-all length is 23 inches with swivel hook and 19 inches with stiff shackle.

Sauerman Bros., Inc., Dept. C&E, 616 S. 28th Ave., Bellwood, Ill.

Circle No. 228.

***PORTO-PLANT**
SALES AND
PERFORMANCE...

Leaders

Point to
Burmeister
by Far and Away...
IN PORTABLE BATCHING!

Only the best was good enough for the contractors and ready mix operators listed below. Their desire for true portability with large capacity naturally specified Porto-Plant . . . by Burmeister.

As there will be many imitations attempting to offer some of the features of the Porto-Plant, be sure and specify Porto-Plant when you want true portability with the latest in portable batching.

SEE FOR YOURSELF WHY THE
PORTO-PLANT HAS BEEN
ACCLAIMED LEADER IN THE
FIELD OF PERFORMANCE.

PURCHASERS OF PORTO-PLANTS

Central Ready Mixed Concrete
Milwaukee, Wisconsin

Goff-Kirby Company
Cleveland, Ohio

H. and H. Construction Company
Miami, Florida

Newkirk Transit Mix, Inc.
Joliet, Illinois

R. I. McDonald and Brothers, Inc.
Rochester, Pennsylvania

Northwest Materials Inc.
Bryan, Ohio

Southern Michigan Materials
Butler, Indiana

J. H. Shears Sons, Inc.
Hutchinson, Kansas

Griffith Ready Mix Concrete Co.
Griffith, Indiana

Fox Valley Transit Mix
Aurora, Illinois

C. E. Runions
Fond du Lac, Wisconsin

Certified Concrete
East Chicago, Illinois

Keller Heatt
La Grange, Illinois

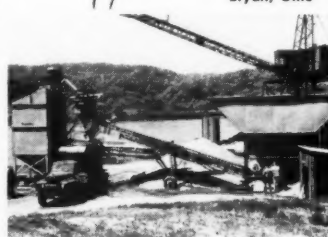
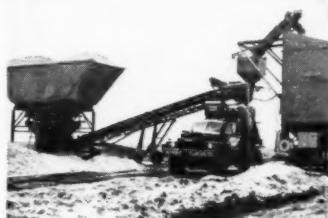
Paul Kent, Inc.
Grandville, Ohio

B. R. De Witt, Inc.
Pavilion, New York

National Stone
Joliet, Illinois

Dolese & Shepard Co.
La Grange, Illinois

Wood Dale Lumber Company
Wood Dale, Illinois



COMPLETE PLANT . . .
NOTHING MORE TO BUY

THE ANSWER TO PORTABLE BATCHING

*PAT. PENDING

Burmeister

COMPLETE PLANTS FROM A SINGLE SOURCE

WRITE FOR FULL DETAILS

Write or call for complete information. We will be happy to answer your questions . . . without obligation. L. BURMEISTER COMPANY, 4545 W. Mitchell Street, Milwaukee, Wis.

For more facts, use Request Card at page 18 and circle No. 504

There's a Trailmobile Trailer for every h



Trailmobile offers a single source of supply for every type of "heavy construction" trailer along with factory service facilities in 54 cities from coast to coast. Beyond this, many of Trailmobile's construction features were designed with time saving "on-site" maintenance in mind. All trailers are available on convenient financing up to five years for qualified buyers. For further information on new or used equipment, write Trailmobile Inc., 31st and Robertson, Cincinnati 9, Ohio.



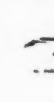
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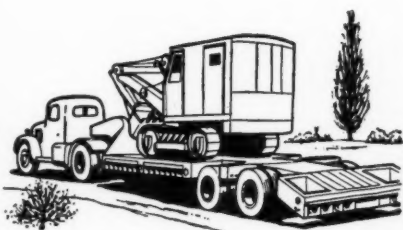
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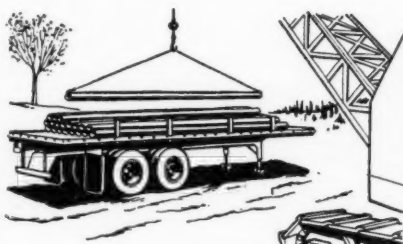
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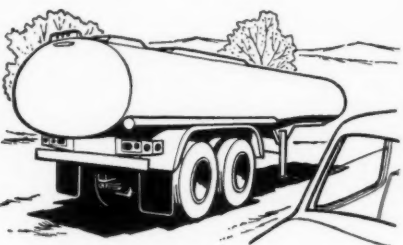
TRAILMOBILE LOW BEDS

... are used to deliver heavy road building equipment to the job area. Steel shovels, bull dozers and other large tractor-treaded units can be easily transported on these powerfully built trailers.



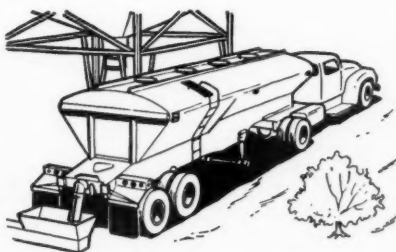
TRAILMOBILE PLATFORM TRAILERS

... are used for carrying lumber, cement forms, drainage tile, straw bales and sundry light equipment. "Sideless feature" permits simpler, faster loading and unloading.



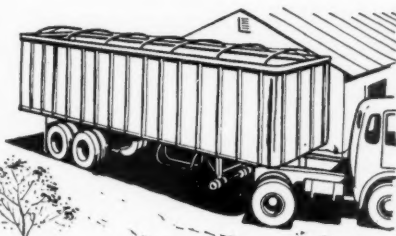
TRAILMOBILE TANK TRAILERS

... are widely used for hauling hot asphalt, road oils, and the great volume of water required at the site. Most units carry a unique guarantee against tank leakage.



TRAILMOBILE CEMENT BULKERS

... transport large amounts of bulk cement to mixing plants at the job site. Both steel and aluminum types offer exclusive step-down design with twin screw discharge.



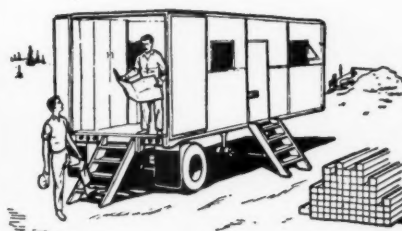
TRAILMOBILE OPEN TOPS

... are extensively used for carrying tools and construction materials. These units can be equipped with tarpaulin roof covers to protect contents against sun, rain or snow.



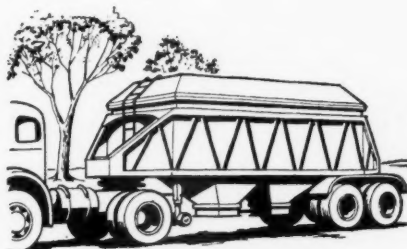
TRAILMOBILE HYDRAULIC DUMPS

... provide big capacity in a dump-type trailer for hauling and unloading sand and gravel. Unusually rugged construction guards against costly out-of-service time.



TRAILMOBILE FREIGHT VANS

... combine weather protection and mobility for hauling general supplies. Low cost used vans provide ideal job site offices, tool shops or storage facilities.



TRAILMOBILE HOPPER TRAILERS

... are used for carrying and spreading aggregate, gravel and sand. Bottom discharge permits uniform spreading of contents over a wide area.

TRAILMOBILE INC.

Subsidiary of Pullman Inc.

Cincinnati 9, Ohio • Berkeley 10, Calif. • Springfield, Mo. • Longview, Texas

Sales and Service from Coast to Coast

TRAILMOBILE INC.

31st & Robertson
Cincinnati 9, Ohio

Please send me further information on the trailer types I have indicated below:

- | | |
|--|--|
| <input type="checkbox"/> Low Beds | <input type="checkbox"/> Platform Trailers |
| <input type="checkbox"/> Cement Bulklers | <input type="checkbox"/> Tank Trailers |
| <input type="checkbox"/> Freight Vans | <input type="checkbox"/> Hydraulic Dumps |
| <input type="checkbox"/> Open Tops | <input type="checkbox"/> Hopper Trailers |

NAME _____

COMPANY _____

STREET _____

CITY _____ STATE _____

Improved air leg easily mounted, reduces wear

Improved models of Le Roi-Cleveland telescopic air legs have been announced by the Le Roi Division of Westinghouse Air Brake Co. The new air legs, the AL92B and AL93B, have an improved ball-lock type of drill connection and internal design changes which reduce wear of parts.

The new connection is a spring-loaded assembly which allows easy mounting or dismounting of air leg drill by simply moving the outer covering release. The sealed mechanism is protected from dirt and sludge which become lodged in the bayonet-type connection, making drill-air leg



assembly a difficult operation.

Both the AL92B and AL93B have 48-inch or 72-inch feeds.

Le Roi Division, Westinghouse Air Brake Co., Dept. C&E, 3716 W. Wisconsin Ave., Milwaukee 1, Wis.

Circle No. 201.

keep your
field office
moving
with the job

Heavy gauge steel channel skids integral with floor for easy relocation intact.

portable

handy huts

Fully prefabricated, the all-steel Handy Hut erects quickly at your job site without cutting, welding or bolting. When skid mounted, the Handy Hut can be easily dragged or winched for relocation to the exact spot you need it. Choice of side and end panels, partitions and accessories offers complete versatility. By using several partitions and access doors along the side, several trades can be housed in separate rooms under one roof. Size: 10' x 8'; longer lengths available in multiples of 2'.



Send for this free brochure with complete description plus instructions for designing your own building.



USF Rigid Frame Utility Buildings provide low-cost durable housing for warehousing, manufacturing or garaging operations in 30', 40', 50' spans. Write for bulletin.

UNITED STEEL FABRICATORS, INC.

WOOSTER, OHIO

PRODUCTS

Hollow Metal Doors • Prefabricated Metal Buildings • Window Wells • Highway Guard Rail • Bridge Flooring • Steel Forms for Concrete Bridge Floors • Corrugated Metal Pipe • Sectional Plate Pipe and Pipe Arches

For more facts, use Request Card at page 18 and circle No. 506

Side-dumping bucket for Cat Traxcavators

A new side-dumping bucket attachment for Traxcavators, designed to give added versatility without sacrificing efficiency in standard Traxcavator applications, has been announced by Caterpillar Tractor Co.

Visitors to the ARBA Road Show in January saw the new side-dumping bucket displayed on the Caterpillar No. 955 Traxcavator, the first model in the company's line supplied with the attachment.

The prime advantages of the new bucket are said to be that it allows the Traxcavator to perform in-line loading, eliminating the need for constant turning in order to dig and load. As well as increasing production by reducing loading time, this feature reportedly serves to lower maintenance cost by reducing wear on tracks, track parts, steering and master clutches, and idlers due to turning.

Side dumping of the bucket is accomplished by the use of a hydraulic cylinder, mounted on the bucket carriage. The bucket is hinged to the carriage, and is firmly locked in place when in the conventional digging position. When side dumping is desired, the operator actuates the hydraulic cylinder by use of a control lever situated to his right, on the hydraulic tank. When actuated, the dumping cylinder unlocks the bucket from the bucket carriage, and swings it into a side-dumping angle of 60 degrees. A



third hydraulic valve, easily installed in the machine's hydraulic system, controls the dumping cylinder.

The cylinder is protected by a reinforced plate steel shield.

Since the new bucket is mounted to the Traxcavator lift and tilt arms by four pins, installation and removal of the attachment are said to be simple and fast. No interference with the use of other Traxcavator attachments is introduced when equipping a Traxcavator with a side dumping bucket.

Caterpillar Tractor Co., Dept. C&E, Peoria, Ill.

Circle No. 51.

Offer new steel bits for down-hole drills

Both 6 and 6½-inch Hole-Master bits, for use with "down-the-hole" drills, have been added to the line of percussion rock drill bits manufactured by Chicago Brunner & Lay Bit Corp.

The splined body of these bits is of

super-tough steel, with fast drilling carbide inserts.

Chicago Brunner & Lay Bit Corp., Dept. C&E, 9300 King St., Franklin Park, Ill.

Circle No. 118.

ROLATAPE

measuring wheels

For FAST,
ACCURATE,
MEASUREMENTS

SEE YOUR DEALER, DISTRIBUTOR FOR ROLATAPE MEASURING WHEEL INFORMATION OR WRITE TO ROLATAPE, INC.
1741 Fourteenth Street, Santa Monica, California

For more facts, use coupon, or Request Card at page 18 and circle No. 507

CONTRACTORS AND ENGINEERS



Offer data computing services for contractors

Services in electronic computing and data processing are offered to construction companies and other firms by The Datics Corp., a new firm organized in Fort Worth, Texas.

Designed to make such data analysis and interpretation available to firms who do not have their own electronic computing equipment, the new company works on a contract basis to figure work quantities and payrolls, and solve other industrial problems that would otherwise require extensive figuring, even with standard automatic office machines.

For roadbuilders and other contractors, the firm analyzes surveyors' information for computing cut and

fill quantities, among other services. Payrolls are a common data processing operation of the new firm; net pay is figured according to the individual pay system, whether wages are paid on piece work, hourly work, or on a salary basis. All withheld items are deducted before the check is written.

The Datics Corp. also makes available the consulting services of its personnel to help contractors and others determine their need for electronic services or for electronic equipment.

The Datics Corp., Dept. C&E, P. O. Box 9128, Fort Worth, Texas.

Circle No. 193.

New power attachment for welding equipment

The Lincoln Electric Co. has announced a new Power Pack attachment for its 500-amp combination ac and dc Idealarc welder. The attachment is designed to permit the welder to be used as a power source for the manual Lincolnweld Model ML-2 semi-automatic submerged arc welder.

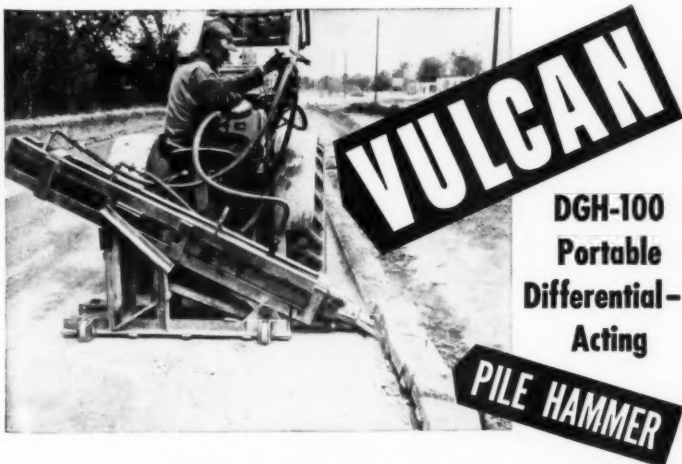
The combination of the Idealarc welder, the ML-2 submerged arc

welder, and the Power Pack is intended to make a package capable of manual welding with dc or ac power and submerged arc with dc power.

The Idealarc operates on single-phase input power.

The Lincoln Electric Co., Dept. C&E, 22801 St. Clair Ave., Cleveland 17, Ohio.

Circle No. 164.



Put this versatile DGH-100 Hammer to work on any job you have * you'll be amazed at the number of jobs it can handle * operates on compressed air or steam * delivers a rated striking energy of 386 pounds * just over 4 feet long it is readily moved about in a jeep. Illustrated here is the DGH-100 Hammer being used with a LeROI Tract-Air breaking concrete curbing.



Manufacturers of Pile Driving Hammers and Piling Extractors Since 1852

VULCAN IRON WORKS INC. 325 North Bell Avenue, Chicago, U.S.A.

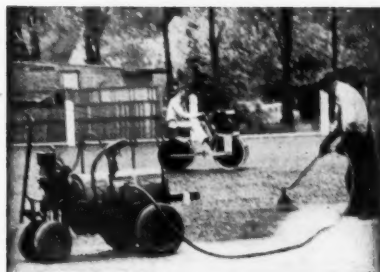
For more facts, use Request Card at page 18 and circle No. 508

JUNE, 1957

◀ This is some of the equipment used at Datics Corp., said to be the only completely integrated, independent data reduction and computing firm in the world.

SPRAY IT RIGHT

Yes. "Right From your shipping drum" . . . with a **TARCO SPRAYER**



Materials Sprayed: Bituminous Binders . . . asphalt emulsions, light tars and cutbacks. **Weed Killers.** Insecticides. **Waterproofing materials** including silicone products. **Cleaning Solutions.** Paints . . . oil and water base.

Fast and Convenient: You can change barrels in 5 minutes . . . 20 to 30 barrels daily. Clean all lines in 3 minutes. You can plan your work and do it at your convenience with your own help . . . simple to operate. Easy to service.

Four Models: . . . with a gasoline engine driven air compressor or gear pump. Wheel mounted or portable. Comes complete, ready to work with hoses, spray bar, nozzles.

Ideal for: Maintenance of all types of pavement. Construction of driveways, parking lots, walks, tennis courts, roadways. **Painting** buildings, bridges, guard rails, equipment. **Sub-sealing** work. **Curing concrete.** **Waterproofing** foundations and roofs.

TARRANT Manufacturing Company

31 Jumel St., Saratoga Springs, N. Y.

For more facts, use Request Card at page 18 and circle No. 509

Break concrete BETTER • FASTER



Brunner & Lay mail points rugged, standard everyday tools. $1\frac{1}{8} \times 6$; $1\frac{1}{4} \times 6-14"$, $18"$ & $24"$ l.u.c.



Sabur® Points for use in concrete with really "tough" aggregate. $1\frac{1}{8} \times 6$; $1\frac{1}{4} \times 6-16"$ l.u.c.



Keen-Kut—a real concrete buster to increase breakage production. $1\frac{1}{8} \times 6$; $1\frac{1}{4} \times 6-14"$ & $18"$ l.u.c.

with the **BRUNNER & Lay** tool best fitted for your job

Only Brunner & Lay offers a complete line of pneumatic tool accessories—each specifically designed for a particular need—each incorporating Brunner & Lay functional design based on 74 years experience—plus the features and rugged construction that have made Brunner & Lay the leader. Ask your Brunner & Lay distributor to show you the tool best for you. Write for new, complete catalog, No. 756.



Brunner & Lay Products

Brunner & Lay, Inc., 9300 King St., Franklin Park, Ill. • Brunner & Lay Rock Bit of Philadelphia, Inc., 2514 East Cumberland St., Philadelphia 25, Pa. • Brunner & Lay of Los Angeles, Inc., 2425 East 37th St., Los Angeles 58, Calif. • Brunner & Lay, Inc., 150 Leslie St., Dallas, Texas • Brunner & Lay Rock Bit of Asheville, Inc., Sweeten Creek Rd., Asheville, N. C. • Brunner & Lay of Portland, Inc., 660 N. Tillamook St., Portland 12, Ore. • Birmingham Rock Bit Co., Inc., 5-18th St., S.W., Birmingham, Ala. • Brunner & Lay, Inc., 2 Santa Fe Drive, Denver, Colo. • Brunner & Lay (Canada), Ltd., 6301 Cote de Liesse, Dorval Station, P.Q., Canada

For more facts, use Request Card at page 18 and circle No. 510

163

Product Parade

Add squelch accessory to mobile radio line

A new tone-coded squelch accessory for use with Bendix Dyna-Com mobile communication equipment is announced by the Bendix Radio Division of Bendix Aviation Corp.

The new accessory is said to repel



unwanted communication blocking signals from distant and local stations as well as interfering signals resulting from natural phenomena.

The Quiet-Line accessory is a compact unit designed to be plugged into the control receptacle of any of the Bendix Dyna-Com line of vehicular communication or base station units. It requires no modification of the two-way radio system. The unique switching feature of the Quiet-Line accessory allows the communication system to be operated on either tone-coded or conventional squelch.

Mobile Products Dept., Bendix Radio Division, Bendix Aviation Corp., Dept. C&E, Joppa Road, Baltimore, Md.

Circle No. 60.

Hydraulic tool bends 4-inch pipe 90 degrees

A new lightweight hydraulic bender that will make a full 90-degree bend in 4-inch and smaller conduit and pipe with one ram stroke has been announced by the Greenlee Tool Co. According to reports of on-the-job tests made by contractors, the new lightweight No. 884 Power Bender eliminates costly, time-consuming extra setups usually required when making 90-degree bends on pipe of this size.

The use of high-strength aluminum alloy in this 40-ton bender makes it light enough for one man to carry the heaviest section with

ease. Specially designed pipe supports serve as rollers when the bender is wheeled from one location to another. Its design allows the bender to be used in any position without loss of operating efficiency.

Regularly operated with the No. 798AC-SA Power Pump, and connected by a quick-coupling high-pressure hose, the No. 884 will bend



Circle No. 79.

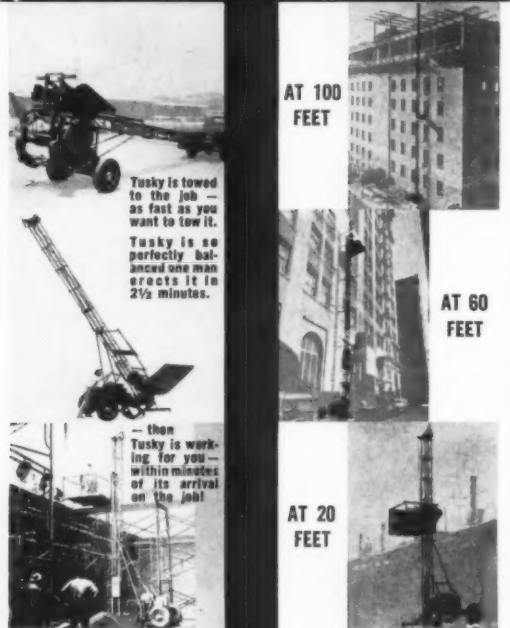
4-inch pipe 90 degrees in 4 minutes. If higher bending speed is desired, the Greenlee No. 797E-SA Power Pump will do the job in only 30 seconds. Any other high-pressure power pump of up to 10,000 psi can be used with the bender.

Greenlee Tool Co., Dept. C&E, 2136 12th St., Rockford, Ill.

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For more facts, circle No. 512



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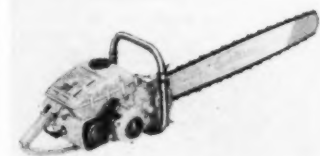
Ask for prices and name of local dealer.
MULLER MACHINERY COMPANY, INC.
Metuchen 15, N. J. Cable Address: MULMIX

For more facts, circle No. 513

Line of 7 saws covers all woodcutting needs

A new line of saws to meet every woodcutting need is announced by the McCulloch Motors Corp. The line offers a choice of gear-driven or direct-drive units for construction work and maintenance, with a complete selection of sizes, weights, and power, the company reports.

Leading the new line are the Model D-44 direct-drive saw, introduced last fall, and the all-new Model 55, a



25-pound, gear-driven model that features two adjustable blade positions—one for perfect balance while bucking, the other for low-stump cutting while felling.

Others in the line include the Models 35 and 39, said to be ideal for clearing land and cutting and pruning trees; the Model 49, a 30-pound unit with blade sizes ranging from 14 to 42 inches; the Model 77, reportedly the most powerful one-man saw on the market; and the Model 99, a two-man saw recommended for construction work and heavy land-clearing operation.

In addition, McCulloch offers three accessories—an earth drill, a brush cutter, and an all-purpose drill. The McCulloch Motors Corp., Dept. C&E, 6101 W. Century Blvd., Los Angeles 45, Calif.

Circle No. 57.

CONTRACTORS AND ENGINEERS

Product Parade

Diesel pile hammer offered in two sizes

A diesel pile hammer, being manufactured in two sizes by the McKiernan-Terry Corp., is said to offer many advantages of mobility, ease of operation and maintenance, and economy.

The completely self-contained hammer, eliminating boilers and air compressors, is light, mobile, versatile, and compact. The DE-30 has a 3,000-pound ram that delivers 45 to 55 strokes per minute with an average energy per blow of 18,000 foot-pounds. It is said to offer most economical driving with 1 to 3-ton piles at bearing from 40 to 90 tons.

The DE-20, a more recent development, has a 2,000-pound ram that delivers 45 to 55 strokes per minute with an average energy per blow of 12,000 foot-pounds. It drives 1½ to 2-ton piles at bearing from 25 to 60 tons.

Design of the McKiernan-Terry diesel hammer reportedly makes for trouble-free operation from the first day of service. A single load line is used for engaging, hoisting, and dropping the ram to start the hammer, and for hoisting and lowering the entire hammer. A forced lubrication system provides a continuous flow of lubricant to the porous-chrome wearing surfaces. Cylinder and ram are each of one-piece construction, and special alloy steels are used for all parts subjected to high-shock stresses. Built-in fuel and lubricant tanks have sufficient capacity for over three days of economical operation.

McKiernan-Terry Corp., Dept. C&E, 100 Richards Ave., Dover, N. J.

Circle No. 43.

Single telescopic hoists permit greater payloads

Lowered costs of bulk hauling through increased legal dump-truck payloads are said to be a feature of The Heil Co.'s new HMT series of single telescopic hoists.

The HMT 63-102 and HMT 63-117 have greater lifting capacity for dumping, with less dead weight than models heretofore on the market, the manufacturer reports. The weight



savings have been achieved without sacrifice of capacity by the use of special-alloy steel, manganese-bronze sleeve bearings, and higher-designed

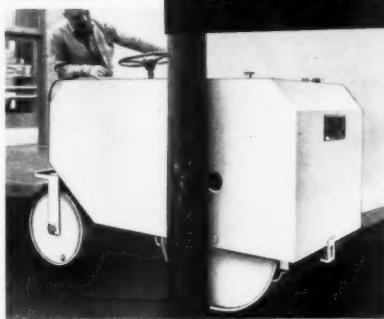
hydraulic pressure systems.

These hoists are said to be the first examples of truck-mounted hydraulic equipment to incorporate the new SAE "O" ring, plus 37-degree-flare SAE fittings in hydraulic pressure lines. These fittings, which replace old-style pipe thread fittings, are simpler and quicker to apply, or to uncouple, and provide tighter, drip-proof connection without the use of pipe dope, long wrench extensions, and brute force, the company engineers claim.

The Heil Co., Dept. C&E, 3003 W. Montana Ave., Milwaukee 1, Wis.

Circle No. 141.

Weights 1800 pounds empty and up to 6000 with ballast.



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PFAHLER MFG. CO.
GALION, OHIO**

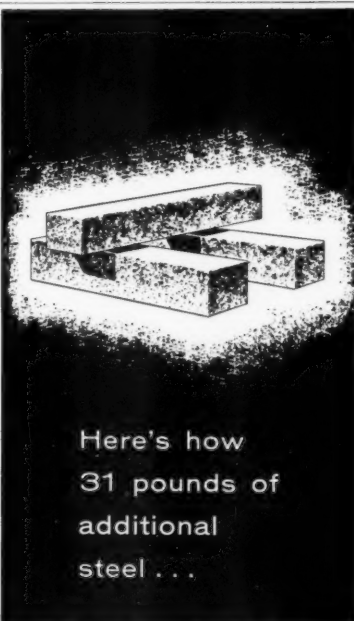
For more facts, use Request Card at page 18 and circle No. 514

THE 1 to 3 TON ROLLER...

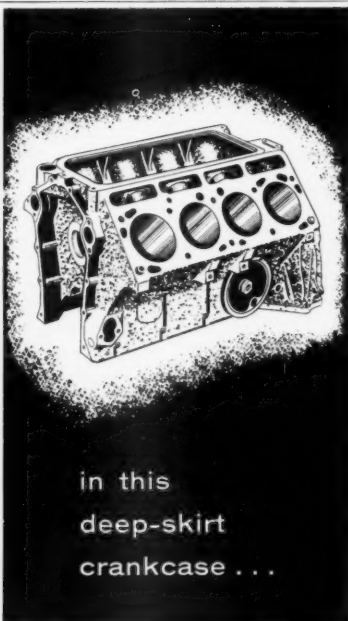
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Compacts to within ½" of wall on right side. Drive and compression roll 30½" dia. x 36" wide. Split steering roll 20½" dia. x 30" wide. Single lever controls forward and reverse through constant mesh transmission—insuring smooth starts. Low, modern trailer available for hauling.

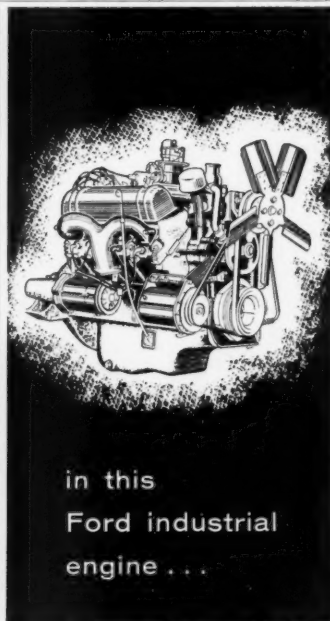
IMPROVEMENTS: New 8 H.P. motor, Timken roller bearings throughout, Timken Detroit Parking Brake.



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31 pounds of
additional
steel ...



in this
deep-skirt
crankcase ...



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Cuts vibration... provides smoother performance ...lengthens bearing life

Thirty-one pounds of added strength—in the form of deep-block construction—pays Ford power users big dividends in engine stamina and performance.

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Whether it's 4-, 6- or 8-cylinder power, see your Ford Industrial Products Dealer. Have him show you Ford's complete line of engines ... including the new super-efficient 220 cubic inch diesel. You'll find there's a Ford engine that's right for your job.



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Once a shift, or every ten hours, one mechanic and two oilers go over each big Euclid, as illustrated in the photograph at the left. As work is done, the crew checks 95 grease points, 11 fill points, and 10 miscellaneous items off their 10-hour check list. The 120-hour servicing is also done in the field. The crew operates from a semi-trailer with Lincoln lubricating equipment as it dispenses several grades and oil from drums, as shown below. Oil filters, gaskets, parts, and tools are stored in cabinets at the rear of the van.

Maintenance setup at Oahe Dam keeps haul units at top efficiency

Preventive program includes service each shift, plus systematic weekly, monthly, and 2,000-hour checks

Preventive maintenance, completely detailed on check sheets, is the secret behind the long equipment life and the minimum of downtime on Western Contracting Corp.'s Oahe Dam earthwork projects.

An excellent example of both is provided by the fleet of 30 Euclid LLD end-dumps that have been hauling their 50-ton loads 20 hours a day for the past two years to build the earth embankment for the big South Dakota Dam.

Last season, the gigantic haul units worked practically around the clock to move a substantial part of the 21 million cubic yards of earth that Western's crews placed in the huge Missouri River Dam.

Some of these Euclids have been working almost continuously since they were bought new in 1950. In fact, one of the first of these huge trucks that Euclid produced, sold to Western seven years ago for use on Fort Randall Dam, is now working on Oahe.

The first Marion M-191 electric shovel, built for western at the same time, is also operating on the Oahe job. Its 13-cubic-yard dipper still sets the pace for the fast earthmoving operation.

Project manager Carl "Rip" Collins, who is supervising Western's \$12.5-million Oahe operation, and master mechanic Max Sanmann are convinced that their program of pre-



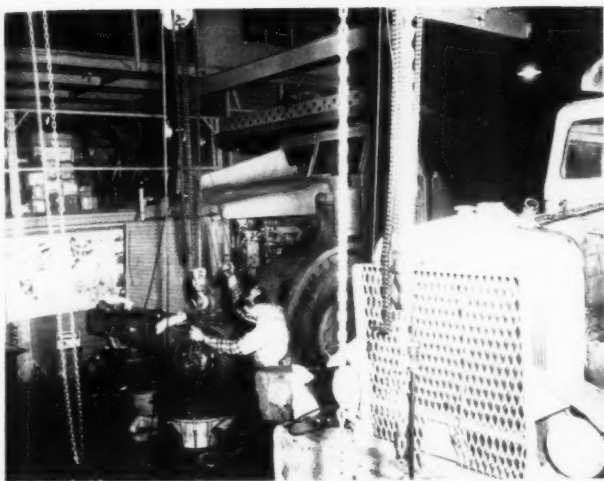
The 500-hour check at the field shop starts as this Euclid 6,000-gallon water wagon is cleaned of mud and dirt by a Malsbury steam cleaner. The cleaner is mounted on a 6x6 army surplus truck so that it can go anywhere in the field.



At the 2,000-hour point, transmissions are pulled out of the larger rigs and sent to the Kansas City, Mo., shops for overhaul. The mechanics at the job shop, here overhauling a tractor for one of the bottom-dump units, stand ready to repair any piece of equipment on the project at any time.



Dale Martin, shop foreman, checks the Kardex file system that keeps a running inventory of all parts stocked. The system also keeps a complete service record of each piece of equipment. Copies of the 10, 120, 500, and 2,000-hour checks are accumulated to serve as a guide to each machine's servicing.



Using a Yale 2-ton hoist carried by an overhead crane, a mechanic handles a heavy differential assembly for the Euclid bottom-dump tractor, foreground.

ventive maintenance deserves much of the credit for the excellent production, safety, and service records of this equipment.

Use check lists

The preventive maintenance program starts with the once-a-shift servicing of every machine in the spread. A weekly or 120-hour check is the second step, and additional servicing at the 500 and 2,000-hour points completes the routine program. Each of these is a carefully planned service operation, and the results are recorded on check sheets.

Printed check sheets in three colors, for the 10, 120 and 500-hour servings, provide a complete record of all service operations and a full service history of each machine. The set of 12 shift reports serves as a guide to the mechanic making the weekly check; the accumulation of daily and weekly reports are studied by the shop crew before they give the machine its 500-hour or monthly check.

Frequently, the repetition of some item or note in the daily reports points directly to a source of trouble in some part or assembly. With this clue, the mechanic making the monthly service can investigate further. Often he can replace or correct some minor part and thus avoid a more serious repair and the accompanying downtime.

The 10-hour and 120-hour service operations are handled in the field where service units are set up at convenient locations. Each machine is brought into the shop for the 500 and 2,000-hour checks.

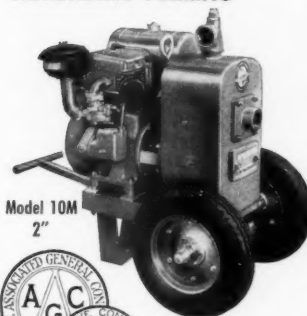
Field service units

Each spread of ten of the big LLD Euclids is served by one field service unit. Similar setups serve other equipment spreads. Each field service unit is self-contained and can operate at any convenient point on the job.

Housed in a large enclosed semi-trailer, each unit has its own Caterpillar D315 electric generator set for power and light. Supplies of lubricants are stored in barrels and dispensed directly to the equipment by Lincoln pumps, hose, and fittings.

(Continued on next page)

Fast, Positive, Built-in
AUTOMATIC PRIMING



Model 10M
2"



WRITE TODAY
for name of your
nearest distributor.
GET FULL DETAILS!

depend on dependable
McGOWAN
LIGHT and **Pumps**
HEAVY-DUTY

COMPLETE CAPACITY RANGE TO HANDLE EVERY JOB

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McGowan pumps are engineered to satisfy every need in the field, efficiently, simply, economically. Improved open-type impeller ... close manufacturing tolerances ... assure minimum maintenance.

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DIVISION of LEYMAN MANUFACTURING CORP., 58 Central Ave., Cincinnati 2, Ohio

For more facts, use Request Card at page 18 and circle No. 516

ROADRANGERS
speed handling
45-ton payloads



This Fisher LOADMOR hopper train is 54' 6" long; has a GCW of 120,000 lbs. Reo V-8 Tractor is equipped with R-46 Fuller 8-speed semi-automatic ROAD-RANGER Transmission.

Where maximum payloads run up to 45 tons, Fisher Sand & Gravel uses 2 Reo Tractors equipped with 8-speed R-46 Fuller ROADRANGER Transmissions pulling double-bottom trains.

Says Bill Fisher, President: "The Reo V-8, together with the 8-speed Fuller ROADRANGER Transmission,

give us ideal performance. The R-46 ROADRANGER is particularly suited to our operation because of the short length of the transmission, the even steps between gear ratios, and the lighter weight as compared to main transmission and an auxiliary or 2-speed axle. The faster shifts and the short even steps between gear ratios are a big advantage because of the high GCW on adverse grades. Each of the Reos has accumulated 70,000 miles of trouble free service."

Fisher Manufacturing, Inc. of Mt. Pleasant, Michigan, builds the double-

capacity super-haul trailers used by Fisher Sand & Gravel Company, Midland ... and markets them to other aggregate hauling firms as well.

Does your application call for an easy-shifting, shorter, lighter-weight, higher capacity transmission ... with short even steps between ratios to keep engine rpm in the maximum hp range? Check with your truck manufacturer or dealer for the right Fuller ROADRANGER for your job, or write Fuller Manufacturing Company (Transmission Division) Kalamazoo, Michigan.

FULLER



TRANSMISSIONS

Unit Drop Forge Division, Milwaukee 1, Wisconsin • Shuler Axle Company, Louisville, Kentucky (Subsidiary) • Sales & Service, All Products, Western District Branch, Oakland 6, California and Southwest District Office, Tulsa 3, Oklahoma.

For more facts, use Request Card at page 18 and circle No. 517



Near the main shop, but out of the repair area, is the contractor's welding shop. Welding machines and torches are used here for gas welding and cutting.



Operating 24 hours a day between the job site and the Standard Oil Co. refinery at Mandan, N. Dak., this Kenworth truck and Trailmobile 8,500-gallon aluminum trailer supply the job with about 18,000 gallons of diesel fuel daily.

(Continued from preceding page)

hoists... ENGINEERED AND designed to suit... yet built from standard parts

Because Superior-Lidgerwood-Mundy hoists are designed and built to specific needs, they perform your lifting tasks more easily and economically.

Because they are built with standard parts which may be modified and recombined, various additional types are available.

Lidgerwood hoist designs have been *proved* on construction jobs all over the world for the past 79 years. Let this versatile experience solve your next hoisting problem. For more complete information, write for Bulletin M 515.

- 1 Freight and Passenger Incline Hoist (250 h.p.)
- 2 Five Drum Gas Hoist with Torque Converter (100 h.p.)
- 3 Three Drum Steam Derrick Hoist. (Duty 55,000 lbs. single pull line at 60 f.p.m.)

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Cable Address—BROSITES, NEW YORK

For more facts, use Request Card at page 18 and circle No. 518

Bins and cabinets in the trailer store oil filters, fan belts, and other frequently needed parts. A desk attached to one wall provides a convenient place for checking, initialing, and signing the check lists.

Three men, one mechanic and two oilers, man each field service unit during each of the two daily shifts. The "Eucs" are brought to the service unit one at a time during working hours for the daily maintenance.

This once-a-shift service is more than a quick grease job, as a glance at the white check sheet shows. The service is broken down into four categories. First, the check list indicates 95 points to be greased. A code key gives the type of lubricant for each.

The second category covers the checking of eleven "fill points," such as crankcase, transmission, radiator and battery. Here too, the check sheet indicates the proper type of oil or lubricant.

The third category on the 10-hour check list is called miscellaneous servicing. It includes a list of ten items such as "clean windshields", "clean and refill air filters", "check tires", and "clean and refill breathers".

Finally, the check sheet calls for the inspection and checking of lights, oil and air lines, belts, drive lines, and

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- Lifetime steel faces should never need to be replaced.
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For more facts, circle No. 519

CONTRACTORS AND ENGINEERS



The shop building is "off limits" for private cars so that haul rigs can maneuver safely between the garage and the parking area. Located on a 40-acre tract next to the job site, it has a heating system in the floor.



A Euclid bottom-dump stops for servicing at the mobile unit. The 10-hour servicing sheets referred to when a 120-hour servicing is done sometimes contain repetitions that point out a possible source of serious trouble.

fire extinguisher. A most important item in this last group reads, "Determine and correct causes if driver reports: low engine oil pressure, abnormal water or oil temperature, unusual engine noise, or poor combustion as evidenced by excessive smoke." In these items are the first clues to major troubles.

Space is provided opposite each item on the check list for the initials of the man doing the work. At the end of the list is a space for the signature of the mechanic in charge. Space is also provided for any remarks.

Weekly check in field

Once each week or every 120 hours of work, the field service crews give each rig a more complete servicing. A yellow check sheet, provided for this service, contains practically all of the items on the 10-hour check sheet plus quite a few more. There are 112 instead of 95 points to be greased and an additional 13 "oil can" points. To the list of fill points are added the steering gear and four rear axle planetary gears.

The list of miscellaneous items to be serviced contains a number of additional items, but the largest addition is the column of parts to be inspected and adjusted. This list includes a rather complete visual check of the engines, chassis, cab, steering, brakes, radiator, and transmissions of the vehicle. If any troubles or defects observed in this inspection cannot be corrected on the spot, the machine is sent to the shop for repairs.

After 500 hours of operation—or approximately once a month—each of the trucks is taken into the shop for a more complete servicing. Before entering the shop, the machine is thoroughly cleaned of all mud, grease, and other dirt by a workman with a Malsbary steam cleaner.

In the shop, all oil and grease reservoirs are drained and refilled. Transmissions and differentials are carefully inspected. If metal cuttings are found in filters or in the drainings, the unit is torn down to find the source of the trouble. Valves and injectors are adjusted, and many other components are checked and adjusted.

If an engine, transmission, or differential needs a major overhaul at this time, the entire unit is removed and replaced with a spare, reconditioned unit. These components are usually given complete overhaul in Western's Kansas City shops; spare reconditioned units are kept on hand

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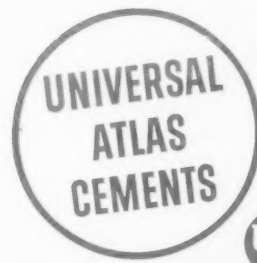


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Modern masonry for modern design laid with **ATLAS® MORTAR Cement**

- Better mortar workability characteristics are the basis for better masonry.
- Field reports confirm that Atlas Mortar contributes to excellent workability, high yields, and weather-resistant masonry.
- Quality-controlled manufacture of Atlas Mortar promotes uniformly good performance and appearance. (Complies with ASTM and Federal Specifications.)

For further information, write Universal Atlas,
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For more facts, use Request Card at page 18 and circle No. 520

so that the truck will not be laid up during the time the engine or transmission is being overhauled.

As with the daily and weekly servicing, there is a comprehensive check list covering the 500-hour overhaul. During this overhaul, the mechanic refers to the check sheets from the daily and weekly servicing of a particular machine. With these, he can note the remarks of the drivers, any excessive use of oil, recurring adjustments, or other entries which might point to some larger or more basic trouble. His completed check sheet for the 500-hour check is filed with the lists for more frequent servicing to complete the history of work on this machine.

At 2,000 hours, the Allison torque converter transmissions are pulled out and sent to the Kansas City shops for complete inspection and overhaul. Spare units are always kept on hand at the job shop so that the truck is laid up only long enough for the exchange to be made.

Field shop

The field shop is equipped to make any necessary repair not only to the LLD end-dump rigs, but also to the Euclid scrapers, bottom-dump haul units, and all the tractors and miscellaneous equipment on the project. A very complete supply of spare parts and assemblies is kept in the shop inventory and carefully registered on a Kardex system. Rarely does anything happen to any of the machines that cannot be repaired right in the field shop without delay.

The shop is housed in a Butler 60 x 140-foot steel frame building sided with Johns-Manville Transitop insulated siding. It is heated by a hot-water radiant heating system in the concrete floor slab, which makes the floor comfortably warm for the men who have to work under the vehicles.

Although the general contract provides for an area of land for the use of the contractor's shop facilities, Western purchased a 40-acre tract adjacent to the job site and located the shops on this tract.

The shop building is divided into two sections, one of them serving the Euclid haul units, and the other tractors and other miscellaneous machines. The stockroom, which carries parts for both groups of equipment, separates the two sections. The Euclid section has four 16-foot-wide doors, and the tractor section has two similar doors.

Inside the well-lighted shops are overhead cranes equipped with Yale 2-ton electric hoists for handling the heavy parts and assemblies. The shop equipment includes all jigs and tools needed to repair any of the machines.

In addition to the parts storage provided in the central section of the shop building, a 30 x 40-foot warehouse attached to the shop is used for the storage of engines, transmissions, and other large parts and assemblies. Parts for some of the machines on the job are stored in separate trailers.

A separate welding shop located near the main shop takes all welding operations out of the repair area. This shop is equipped with two 350-amp

welding machines and with Vickers torches for gas welding and cutting. The welders also have two field welding trucks equipped with Lincoln welders.

Tires and batteries for all of the equipment are handled under a contract by the Firestone distributor in nearby Pierre. A service truck equipped with a crane for handling the huge tires comes out on the job to make the necessary changes.

The comprehensive and systematic preventive maintenance program has undoubtedly contributed to the job safety record as well as to job production. The frequent checking of brakes,

lights, windshields, fire extinguishers, steering systems, and other components keeps the machines in safe operating condition continually, as Western proves in its record of more than a million man hours worked without a lost time accident.

The shop staff of 12 mechanics, three helpers, one steam cleaner and one hydrocrane operator are under the immediate supervision of shop foreman Dale Martin. The over-all maintenance program is handled by master mechanic Max Sanmann. The project manager for Western Contracting Corp. is Carl "Rip" Collins.

THE END

General Tire & Rubber Co. completes four buildings

A major phase of the multi-million dollar divisional construction program has been completed by the General Tire & Rubber Co., Akron, Ohio. The new headquarter buildings at Charlotte, N. C., Boston, Mass., and Denver, Colo., will house the central offices and tire warehouses for the sales divisions. An addition has also been completed at the Brittain tire warehouse.

The completed buildings in the four areas provide a total of 225,000 square feet of space.

"65" PAYHAULER® hauls

4-ton rocks and 2/3-mile haul involved in Oregon road straightening job!

The wet, sticky clay in these pictures will give you an idea of the working conditions encountered by the "65" Payhauler operated by the Funderburk Construction Co., Sutherlin, Ore., on their 2-mile road job near Elkton. This clay cut machine efficiency on the job as much as an estimated 50%. Truck bodies had to be scraped clean periodically. And a bogged-down 1 1/2-yd shovel had to be replaced by a sure-treading 3-yd International Drott TD-18 Skid-Shovel®.

In spite of these rough working conditions...and in spite of big 4-ton blocks of rock found in the clay...the International "65" Payhauler still maintained an average of 96 yds per hour on the 2/3-mile haul to the fill.

Veteran earthmover and Payhauler operator, Aaron Johnson, stated, "Here is the poorest loading material I've ever seen. Still I'm getting six 16-yard loads each hour over a cycle distance of 1 1/3 miles."

Don't let unexpected weather and resultant job-bogging clay, mud, or water hold up your off-highway hauling jobs. Consider these all-weather, all-condition Payhauler advantages: proper weight distribution with 71% of total load on "95" drive wheels...74% of total load on "65" drive wheels; ample power from turbo-charged diesel engines with built-in fuel savings up to 10%; maximum power-transfer efficiency of International's long-lasting cerametallic-faced clutch; and load-matched gear ratios for smoother, faster selection of the right gear for every grade...every road condition.

Rock, bigger than 3-yd Skid-Shovel bucket, found in wet clay cut operating efficiency. Payhauler body, fabricated from abrasion-resistant high-tensile steel, together with strongest frame in its class, stands up to tough punishment of rock loading.



**INTERNATIONAL
CONSTRUCTION
EQUIPMENT**

International Harvester Co., 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors... Self-Propelled Scrapers... Crawler and Rubber-Tired Loaders... Off-Highway Haulers... Diesel and Carbureted Engines... Motor Trucks... Farm Tractors and Equipment.



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Rubber duct former makes cores in concrete

A new means for producing continuous cores in concrete structures of all sizes is represented by the rubber duct former, consisting of either pneumatic tubes or solid rubber of rectangular section. The former is particularly recommended for use in precast and prestressed concrete beams and slabs.

The success of this innovation is said to be due to the toughness and elasticity of the natural rubber used,

its ability to withstand repeated re-use contact with green concrete, and the smoothness and uniformity of the bore it produces both in precast and on-the-job work.

The standard length of the tubes is 60 feet and the range of diameters available is $\frac{3}{4}$ to 12 inches. It is possible to join several standard lengths together to a maximum of six, giving a total working length when inflated of about 330 feet. Greater total

lengths create excessive friction on withdrawal. It is possible, however, to have two 330-foot lengths joined and withdrawn in opposite directions.

After the concrete has set, usually in about 12 hours, the tube is deflated and withdrawn. The tubes are used for forming straight or curved ducts in any type of concrete. The only other way of achieving similar results would be to use metal or fabric formers and leave them in position.

Precast concrete

For precast concrete products, rub-

ber pneumatic tubing is used to form continuous ducts in hollow concrete slabs and beams for floors and roofs to save weight and increase thermal insulating capacity; also for piles and many other precast elements. For this type of work, the tubes should be held at intervals along their length either by temporary locating devices suitable for withdrawal while the concrete is green or by permanent means such as wires attached to the mild steel reinforcement.

Tubing is guaranteed by the makers for 100 uses, but it is common to find instances where 300 uses are regularly obtained. Several contractors have testified to well over a thousand uses for one length.

Prestressed concrete

In recent years there has been a growing use of prestressed concrete in building and civil engineering works. Ducts have to be performed in the concrete to receive the prestressing cables, and the use of pneumatic rubber tubes dispenses with costly expendable tubes and avoids the inconvenience of tapered cores or withdrawable metal tubing.

Many concrete designers prefer the ducts to be formed by removable cores, because when the cable is subsequently grouted it bonds well with the concrete walls of the duct, whereas the same bond cannot be anticipated where formers are left in as permanent lining. Pneumatic rubber tubes are shown to their best advantage in prestressed concrete work, where constant repetition of the process demands the use of a non-expendable former.

Among the reported advantages of rubber duct tubes in prestressed concrete construction are:

1) The duct so formed in the concrete enables a first-rate bond to be established between grout and concrete.

2) Casting can be done prior to delivery of the pre-stressed cables and, owing to the excellence of the duct, no difficulty should be encountered in threading the cables.

3) Speed of operation.

4) Easy storage, the tubes being rolled up and housed in a small space.

The current issue of *Rubber Developments* contains complete details and illustrations on this new method of concrete coring, including reference to its use for drainage and water supply systems. For a free copy, write to the Natural Rubber Bureau, 1631 K St. N. W., Washington 6, D. C.

Circle No. 229.

Parsons representatives

Four district sales representatives have been appointed by The Parsons Co., Newton, Iowa, a division of Koehring Co., Milwaukee, Wis.

Eugene H. Nelson will cover New England and the Atlantic Seaboard states. Robert J. Arbs will cover an area in the south that extends from Florida to eastern Texas. Russel J. Dye will cover the western section of the country, and John J. Harvey, the midwest states.

For more facts, circle No. 521

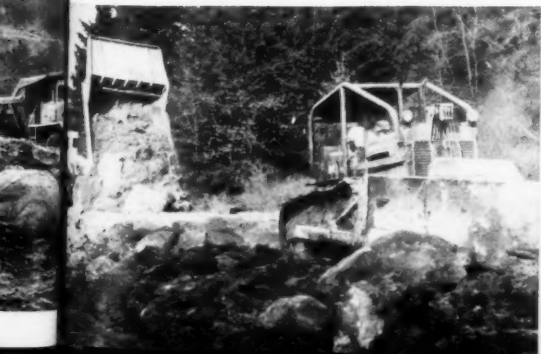
16 yds per hour

Bit of job-bogging sticky clay!

able-acting hoist cylinder in all stages
106,300 pounds of force in first stage
es body in seconds. Hydraulic snubbing
on prevents undue stress on hoist cyl-
ers and "gentles" body return to frame.

International Drott TD-18 Skid-Shovel
replaced 1½-yd shovel to load clay, big
boulders into "65" Payhauler. "65" gives
you big, bonus-producing 18-ton capacity,
Model "95" 24 tons.

International trio...TD-18 Skid-Shovel,
TD-24 tractor and Model "65" Payhauler
promote production for Funderburk Con-
struction Co., in spite of wet, sticky clay
and big, stubborn rock.





Harold Mathias, field service man for John Fabick Tractor Co., checks the compartments of the McCabe-Powers Service-Master body of the Ford F-250 pickup truck.



Dealer's service men tackle tough repair jobs with well equipped trucks

When the contractor calls for service in the field, the John Fabick Tractor Co., St. Louis, Mo., Caterpillar distributor, is ready with trained service men and a fleet of service trucks equipped to handle practically any maintenance or repair operation. This fleet of 40 service trucks and the skilled men who use them serve roughly a 200 mile-radius from the Fabick Tractor headquarters in St. Louis, and their branches in Sikeston and Jefferson City, Mo., and Salem and Marion, Ill.

Typical of the field service men is genial Harold Mathias whose friendly and businesslike manner, plus 6-foot 4-inch 220-pound stature, immediately inspire the customer's confidence. Mathias is one of the nine field service men working under the supervision of Lynn Whitworth, service manager of Fabick's St. Louis branch, and general service manager Erve Wessels.

Arriving on a job in response to a customer's call, Mathias slips into his coveralls and tackles the trouble

whether it involves minor maintenance or a major repair. The Ford F-250 pickup truck that brings him to the job is a self-contained shop which generally holds everything he needs to make the repair.

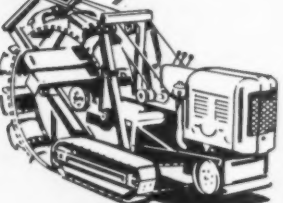
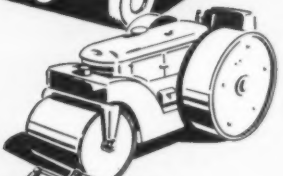
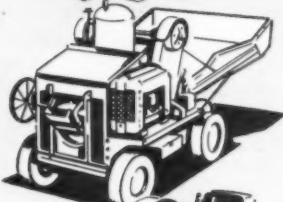
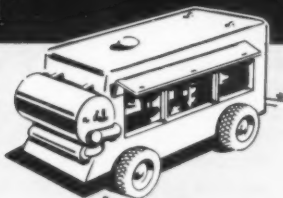
The $\frac{3}{4}$ -ton truck has a McCabe-Powers Service-Master body which includes compartments for tools, supplies, parts, and equipment. Hinged doors on the side compartments fold down when open to form convenient shelves. A sliding top cover encloses the 4-foot-wide \times 3-foot-high central compartment where tool boxes and the larger tools and equipment are carried. All of the doors have locks, making the rig practically tamper-proof when closed up and locked.

Equipped with 7:50 \times 17 tires, the heavily loaded truck travels to almost any off-highway spot where equipment is located. Yet, on the highway, it rolls along at top road speeds to reach its destination in a hurry.

Starting booster

A dead or low battery, a frequent

MORE THAN 100 BASIC ENGINES, BUILT TO 2,000 DIFFERENT SPECIFICATIONS,



**EQUIP CONTINENTAL
WITH POWER PLANTS
TAILORED TO THE NEEDS
OF
CONSTRUCTION MACHINERY
OF PRACTICALLY ALL
SIZES AND TYPES**

Continental Red Seals for specialized applications are available at closely-spaced power levels, in liquid-cooled and air-cooled models, for use on all standard fuels. And, strictly on the score of performance, economy and dependability, they are finding their way into more and more leading makes of road building and construction equipment for every operation from excavation on through final grading. Every Continental Red Seal is not only built for its job, but backed by parts and service facilities from coast to coast.



A COMPLETE LINE OF SMALL AIR-COOLED ENGINES

In addition to its large engines, Continental builds an outstanding line of heavy-duty air-cooled four-cycle models for industrial applications requiring 2 to 4 h.p. Advanced engineering gives them easy starting, high dependability, and unusual lugging capacity at low speeds. For information, address Air-Cooled Industrial Engine Division, 12800 Kercheval Avenue, Detroit 15, Michigan.

Continental Motors Corporation

MUSKEGON • MICHIGAN

6 EAST 10TH ST., NEW YORK 17, NEW YORK • 3817 S. SANTA FE AVE., LOS ANGELES 38, CALIF.
6218 CEDAR SPRINGS ROAD, DALLAS 5, TEXAS • 1252 DAKLEIGH DRIVE, EAST POINT (ATLANTA) GA.



Welds.... runs tools and lights!

... take it ANYWHERE!

This handy
HOBART Welder
KEEPS JOBS MOVING



HOBART BROS. CO., Box 867, Troy, Ohio

Without obligation, send complete information on items checked:

☐ amp. capacity
☐ AC Welder-AC Power Combination
☐ "Contractor's Special" engine drive
☐ "Husky Boy" Air Cooled DC Welder

Name _____ Position _____

Firm _____

Address _____

Hobart "One of the world's largest builders of Arc Welding Equipment."

For more facts, use Request Card at page 18 and circle No. 522

For more facts, use Request Card at page 18 and circle No. 523

CONTRACTORS AND ENGINEERS

Special bodies on service trucks carry parts, equipment, and tools for maintenance or repair jobs in the field

source of trouble, presents no problem to the service man. In addition to its own 12-volt battery, the truck carries a second battery. The two are coupled together so that either 12 or 24 volts are available. A patented set of lead wires 18 feet long reaches from the service truck to the other engine, and a remote control switch permits Mathias to switch his booster batteries on or off from that distance. The generator of the service truck keeps both batteries charged.

Another built-in feature is a Bendix 12-cfm air compressor that operates from the truck engine. With its two supply tanks, this compressor produces enough air to operate a ½-inch air-wrench or a paint spray gun. A siphon nozzle attached to the air hose sprays cleaning solvent for rapid and convenient cleaning of parts.

If there are heavy parts to be lifted or moved, the truck again plays the key role. Out of the rear compartment Mathias produces a telescoping A-frame that attaches to the rear of the truck frame and can be extended up to 12 feet in height. He then mounts a Manning-Maxwell-Moore 2-ton capacity Tugit hoist. This rig handles all but the heaviest of parts and assemblies for any of the equipment he expects to service.

If the job requires a different type of lift, there is a 15-ton Simplex screw jack in one of the compartments, as well as a small hydraulic jack.

If in the course of the repair job, the service man needs a vise, a special fitting on the right rear corner of the Powers body provides a rigid

attachment for an extension bar that carries a Columbian vise. When not in use, the vise and its mounting are quickly removed and stored inside the body.

Tool compartments

A quick glance into the compartments of the Powers body discloses a few of the many tools and gadgets that make this repair service valuable. In one compartment are a sledge hammer, a series of pullers, and a spring scale for checking tension in clutch adjustments. The next compartment contains an assortment of gaskets and gasket materials.

On the opposite side of the truck are similar compartments loaded with an assortment of bolts, nuts, lock washers, several types of special oils, a Pyrene fire extinguisher, a Sun condenser tester, tachometer, fuel rack setting gage, and many more.

A length of clear plastic hose filled with water seems out of place, but Mathias explains that this enables

(Concluded on next page)



A plastic hose filled with water enables Mathias to check the exact level of both ends of the Preco automatic blade control for the Caterpillar No. 12 motor grader.



Bores 1 to 10 ft. diameter holes as deep as 200 ft.

- Drill caisson pier holes**
- Dig and shape belled footings**
- Pre-bore concrete piles**
- Explore for gravel deposits**
- Bore air shafts for tunnels**
- Dig manholes, cesspools**
- Precision Excavating**
- Sample underground deposits**

ONLY A CALWELD can do all these excavating jobs. *It digs big...* holes up to 10 ft. in dia. *It digs fast...* down to 45 ft. in depth per hour. *It digs deep...* down to 200 feet. *It digs with precision...* absolute vertical holes to exact specification. It travels... on its own truck chassis. *It's one man operated* and it makes money for any contractor, large or small. Write for information.



CALWELD
BUCKET TYPE
EARTH DRILLS

CALWELD, INC.
7222 E. Slauson Ave.
Los Angeles, Calif.

For more facts, use Request Card at page 18 and circle No. 525

CUT DIGGING TIME and COSTS with the LOW COST PREWITT HORIZONTAL DIGGER



- Designed for Laying Main and Under-ground Line.
- Drills Through Embankments.
- Drills Under Highways and Sidewalks.

Prewitt's new HORIZONTAL DIGGER gives low cost, high speed performance for all horizontal drilling up to 48 feet in all types of soil. Rugged, maneuverable, it mounts easily on skids... requires small operating space.

See Your Dealer or Write for FREE LITERATURE

J.R. PREWITT AND SONS
SINCE 1929

Dept. 202 • Pleasant Hill, Missouri • Phone 40
For more facts, circle No. 524



After the Columbian vise is attached to a special bracket on the rear of the truck, Mathias renews a bolt thread.

depend on dependable

McGOWAN PUMPS

LIGHT and HEAVY DUTY

... backed by more than a century of engineering and in-the-field experience

McGowan Pumps designed and shop tested to meet A.G.C. standards

DISTRIBUTORS NOTE!

A Number of Attractive Territories Still Available

If your territory is open, here is an opportunity to increase your earnings with this respected, well-known brand. Easy to sell ... highly profitable ... COMPLETE LINE of Self-Priming Centrifugal and Diaphragm Pumps.

WRITE TODAY FOR FULL DETAILS.

McGOWAN PUMPS

Dependable Pumps Since 1852

DIVISION of LEYMAN MANUFACTURING CORP., 58 Central Ave., Cincinnati 2, Ohio

For more facts, use Request Card at page 18 and circle No. 526



Mathias holds the remote switch for charging the battery of this No. 12 motor grader, as Leo Clark of Fruin-Colnon Contracting Co., St. Louis, Mo., starts the engine.

(Continued from preceding page)

him to check the exact level of both ends of the Preco automatic blade control for Caterpillar motor graders.

In the big central compartment of the truck body are two big Snap-On tool boxes loaded with every small tool needed for this work. This compartment also carries the big tools, the A-frame, and any large parts or assemblies for the equipment being repaired.

Service library

One of the smaller doors in the side of the truck body contains a complete library of service manuals for practically every Caterpillar machine Mathias expects to service. Not only does he have a complete set for his own reference, but he carries a few extras to supply customers.

Whether the service call requires the repair or replacement of some bulky, heavy tractor component or the delicate adjustment of the electronic blade control of a motor grader, Harold Mathias, and the men who operate the other 39 Fabick service trucks, have the skill and the equipment to do the job right on the spot.

THE END

New film covers compressed air systems

"Overworked and Underpowered" is the title of a new 16 mm sound-color film on compressed air systems.

It shows how a correction of 5 per cent faults in an air system can result in 95 per cent savings in production efficiency, and points out common difficulties, together with remedies for them.

The film is the newest educational aid put out by the Institute. Information on film showings can be had from Edmond C. Powers, Educational Committee, Compressed Air & Gas Institute, 1400 Terminal Tower, Cleveland 13, Ohio.

Tallamy establishes BPR Division of Development

Federal Highway Administrator Bertram D. Tallamy has established a Division of Development in the Bureau of Public Roads to initiate and execute development work of the Bureau, and integrate it with highway programs of the Bureau, states, and other federal agencies, including foreign aid programs.

H. A. Radzikowski heads the new division.



Manufactured to comply with Federal and all state highway specifications

Wheeling Corrugated Metal Culvert Pipe withstands the torture of time and traffic — and saves highway construction dollars

It's difficult to tell exactly how long Wheeling Galvanized Corrugated Culverts will last. So often they actually outlast the road itself!

That's because Wheeling Metal Culverts can really take it! They're flexible, durable, dependable. They're stronger yet lighter. Naturally long sections are easier to handle, economical to ship and speed construction.

Wheeling Culvert Pipe or Pipe Arch, in Copper

Steel or Copper-bearing pure Iron, plain galvanized or bituminous coated (with or without paved invert) comes in a wide range of gauges and diameters.

Best of all, all are immediately available — where you want it, when you want it — right from the Wheeling warehouse or Culvert Shop nearest you. For full details contact the Wheeling warehouse, Culvert Shop, or sales office nearest you.

WHEELING CORRUGATING COMPANY • WHEELING, WEST VIRGINIA
IT'S WHEELING STEEL



19 WHEELING WAREHOUSES, CULVERT SHOPS and SALES OFFICES: Atlanta, Boston, Buffalo, Chicago, Columbus, Des Moines, Detroit, Houston, Kansas City, Louisville, Madison, Martins Ferry, Minneapolis, New Orleans, New York, Peoria, Philadelphia, Richmond, St. Louis.

For more facts, use Request Card at page 18 and circle No. 527



maintenance

Care of parts, attachments assures long life for portable electric tools

by **GEORGE W. HERBST,**
Manager of Product Service
Black & Decker Mfg. Co.
Towson, Md.

Many time-consuming manual jobs have been eliminated by portable electric tools which, with the flick of a switch, can drill, saw, grind, polish, drive screws, shear, hammer, and sand much faster than any man. While these tools require comparatively little care, intelligent maintenance, and a knowledge of the tool's capacity, will increase the life and value of these tools.

Portable and hand-operated electric tools consist of three large parts—switch, motor, and gear assembly. The most common motor used is the "universal" type, which gives the same performance on either ac or dc power of 25 to 60 cycles. The motor is comprised of a wound field, a wound armature with commutator, and a pair of spring-mounted brushes to complete the electric circuit from the line through the field to the armature. From the motor, the reduction gearing drives a spindle connected to a chuck for drilling, a flexible pad and disk for sanding, or an abrasive

(Continued on next page)

Wire sizes for extensions to 115-volt tools

Table 1.

Full-load ampere rating of tool	0- 2.00	2.10- 3.4	3.5- 5.00	5.10- 7.0	7.10- 12	12.1- 16.0
Distance (one way)	Wire size (B&S gage)					
25 ft.	18	18	18	18	16	14
50 ft.	18	18	18	16	14	12
75 ft.	18	18	16	14	12	10
100 ft.	18	16	14	12	10	8
200 ft.	16	14	12	10	8	6
300 ft.	14	12	10	8	6	4
400 ft.	12	10	8	6	4	4
500 ft.	12	10	8	6	4	2
600 ft.	10	8	6	4	2	2
800 ft.	10	8	6	4	2	1
1,000 ft.	8	6	4	2	1	0

Note—If voltage is already low at the source (outlet), have voltage increased to standard, or use a much larger cable than listed in order to prevent any further loss in voltage.



New International
 "A-Line" Truck

ANOTHER NEW INTERNATIONAL ...STEERED BY ROSS



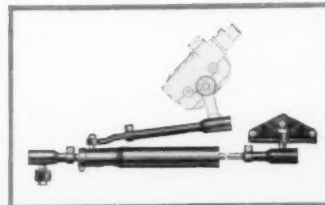
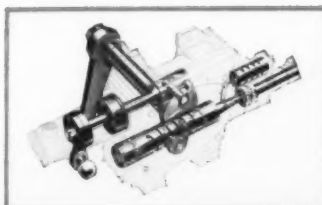
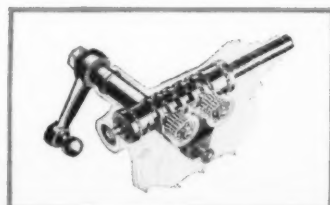
● They're new and they're news . . . these distinguished new International "A-line" trucks.

And they're a happy combination of fresh, clean "Action-Styling" and handling ease, plus famed International truck performance and dependability.

Among many outstanding features for "relax as you work" operation, is easy, safe, economical Ross Steering.

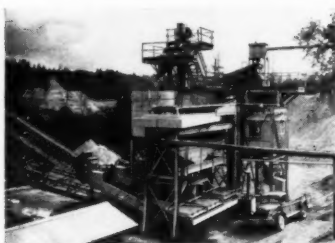
Ross invites discussion of any steering problem—manual or power.

ROSS GEAR AND TOOL COMPANY, INC. • LAFAYETTE, INDIANA
 Gemmer Division • Detroit



CAM & LEVER MANUAL . . . HYDRAPOWER INTEGRAL . . . HYDRAPOWER LINKAGE

For more facts, use Request Card at page 18 and circle No. 529



Plan To Produce Your
 Own Aggregate?

Consult EAGLE About
 Washing-Classifying
 Equipment!

Eagle pioneered concrete aggregate washing - classifying - dehydrating equipment. Eagle engineers have vast experience. Eagle has more installations than all other makes combined. Eagle has the broadest line. Nationwide factory trained sales-service organization.

OUR 85th ANNIVERSARY



For more facts, circle No. 528

JUNE, 1957

(Continued from preceding page; Article continued on page 177)

Possible causes of motor trouble and their remedies

Fault	Check for This	Remedy
New tool does not operate.	1. Power line dead; fuse blown. 2. Receptacle, plug not making contact. 3. Either or both brushes not making contact with commutator; stuck in holder.	2. A tool may get by its first test with a brush stuck in the holder but a subsequent jar may break the contact. Look for a burr in the holder if the brush does not slide freely. Do not sand the brush.
Tool has been in service but motor does not operate, takes no current.	1. Poor contact at receptacle. 2. Broken conductor in cord. 3. Brushes worn out. 4. Switch not making contact. 5. Broken motor leads, loose connection. 6. Open circuit in field coil. 7. Two or more open coils in armature.	2. Cut off broken end or install new cord. 3. Get new brushes from the manufacturer. 4. Replace the mechanism. Parts not available.
Hums.	Short circuit in field.	6. Replace field. 7. Replace armature. Replace field.
Operation of motor slow and jerky, excessive sparking at commutator.	Short circuit in armature; charred insulation may give away location of short. Solder may be thrown from affected commutator bars.	Replace armature. An accumulation of dirt with carbon and metallic particles between commutator bars causes a short.
Excessive speed, poor performance.	Partial short circuit in field coil; resistance of coil will be more than 10 per cent low.	Replace field.
Ring fire around commutator.	Open circuit in armature. Burned copper at one or more pairs of commutator bars a sign of open circuit.	Replace armature. Commutator dirt causing shorts may melt solder from commutator at bars affected, leave circuit open.
Motor heats.	Hot weather increases temperature. Overhead-voltage too low; too much pressure on tool; cutting edge dull. Ventilation may be restricted by accumulation of dirt. Solder thrown from all commutator bars evidence of overload abuse.	Low voltage may be due to small extension. Conductors in such extensions should be larger than conductor in tool cord. When insulation has not been destroyed, commutator can be resoldered. Check fields for cause of armature overheating which could destroy a new armature.
Operator gets shock.	Grounding wire not connected. Ground may burn off conductor at a point where insulation failed and cause motor to show symptoms of open circuit. It may go unnoticed until this happens.	Grounds may be due to lead insulation failure or metallic chips on switch. Accumulation of carbon or metallic dust on brush holder insulation may allow flow of current from holder to housing. If ground can be located and cleared, revarnish and test with megger. Otherwise replace winding affected.

Good Roads "ODELL" SPREADER

For aggregate and asphalt spreads up to 8-inch depths



- Fits All Standard Dump or Semi-Dump Trucks
- Needs No Special Attachments
- 2-Man Operated
- Spreads Any Width to 10 Feet
- Smooth, Accurate Spread

Designed for contractors, by a contractor, the "Odell" aggregate and asphalt spreader out-performs any spreader on the market.

Hot or cold-mix asphalt, bank-run gravel, coarse slag or stone, limestone, cinders and practically any kind of base material (up to 4" in diameter) can be spread up to 8" in depth. Width of box is 8 ft., adjustable to 10 ft. spreads in 2" increments. Block-off plates supplied for narrower spreads.

Extremely accurate spread depth is controlled by the exclusive "floating" strike-off bar, mounted on runners independent of the roller and hopper. The wide steel

rollers eliminate tire marks, ruts, etc., assuring absolute smoothness of spread. Low in original cost, the Odell needs no special truck attachments. It fits all dump and semi-dump trucks... hooks up in a matter of seconds.

Usually operated by only two men, the use of the Odell relieves extra manpower to perform other important work. Paving contractors report savings of over 50% on average jobs since switching to the Good Roads "Odell" Spreader.

For complete details see your Good Roads distributor, or write Good Roads Machinery Corporation, Minerva, Ohio.



For more facts, use Request Card at page 18 and circle No. 530

BHEW

Custom-Built

HYDRAULIC CYLINDERS

Longer Life, Better Performance for Materials Handling Equipment

1. Cylinder barrel and non-adjustable gland welded into one piece, eliminates joint, makes small O.D. in large single and double-acting hoist cylinder.
2. Accurately honed barrel.
3. Hard chrome-plated rod.
4. Flow regulating or pilot operative check valve in base, when required.

BHEW custom-built hydraulic cylinders give dependable operational performance wherever they are used. These efficient, close-tolerance cylinders require minimum mounting space; their cost is reasonable; there is no charge for tooling. BHEW builds cylinders to meet your specifications, delivers them on schedule.

BHEW CYLINDER FEATURES: • Standard and special designs available. • Double or single acting and telescopic. • 1 1/2" to 8" bore. • Strokes up to 156". • Smallest possible O.D. and retracted O.A. length. • Oil cylinders with 1,500 psi or 3,000 psi working pressure, pneumatic up to 150 psi. • Cup-type, ring-type or O-ring construction. • Choice of mounting.

Send us specifications of your requirements, for full information.

Our engineers will be happy to work with you on any cylinder problems you may have. Without charge, of course.



BENTON HARBOR ENGINEERING WORKS, INC.
622 Langley Avenue, St. Joseph, Michigan

For more facts, use Request Card at page 18 and circle No. 531

CONTRACTORS AND ENGINEERS

(Continued from preceding page)

wheel for grinding.

The net weight of a tool varies from 3 pounds for a 1/4-inch utility drill, 11 pounds for a 6 1/2-inch heavy-duty saw, 12 3/4-pounds for an automatic polisher, and on up to 29 pounds for a 2-inch hammer.

Maintenance

Portable electric tools for abrasive work require more attention than others. Sanders, polishers, and grinders cause grit and dust to be in the air. Some of this foreign matter, which may get into the motor and brushes, will cause wear or grounding if it is not removed periodically.

From time to time, with the tool running, an air hose should be held to the intake ventilating openings so that the foreign material that has collected can be blown out. If the tool is in constant use, it should be air-hosed every two or three weeks; if it is used intermittently, this can be done once a month. When this care is neglected, new brushes or a complete overhaul job may be needed sooner than expected.

Other portable electric tools—such as drills—which create no great cloud of dust or foreign matter in their work, need an air-hosing about every 90 days.

Unless the tool has been properly grounded, the operator may receive a severe shock in damp weather or where abrasive dust is likely to create grounds. Most of the latest tools are equipped with a 3-pole attachment plug, which automatically grounds the tool when the plug is inserted in an outlet. An adaptor compensates for an outlet with only two poles. Instructions for proper grounding of portable electric tools should be followed carefully to avoid any chance of an electrical shock. The grounding connection should be made before switching on the power supply.

Gears should be lubricated regularly; the intervals at which this is done depends on the amount of usage the tool gets. It is important to follow the manufacturer's specifications and instructions when cleaning out old grease from the gear case and when cleaning gears with a good solvent. The refilled gear chamber should not be more than 1/2 to 3/4 full; if too much lubricant is used, it may seep through the bearings into the motor and damage the windings.

Bearings, unless "permanently" lubricated, should be greased periodically. A closed-type grease-sealed ball bearing should be wiped clean, not lubricated. A solvent should not be used in the cleaning, as it dilutes the lubricant.

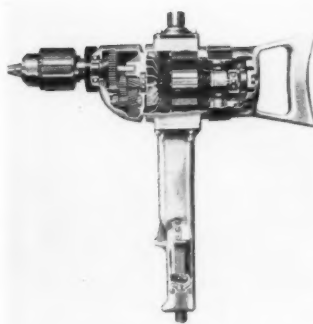
Sander gears are best lubricated with the manufacturer's grease. The

dirty grease can be washed out with kerosene, and the gear case should not be more than 3/4 full of fresh grease. Under regular use, the lubricant will last for 30 days.

Care of parts

A clean cable will not be ruined by oils and greases. Dragging cable across rough or sharp surfaces might cut or slash it, and using cable as a handle to carry the tool will strain the electrical connections.

When an extension is needed to reach a particular job, an adequate size cable will prevent voltage drop; cords such as those used on lamps and similar small appliances are unsuitable. The motors in portable electric tools are designed so that they will operate satisfactorily on a voltage variation of 6 per cent above or



The life of the component parts of this Black & Decker 3/4-inch standard drill, shown in the cutaway view, can be lengthened considerably if the operator or mechanic knows and gives prompt attention to any sign that something is wrong.

below the indicated voltage.

A 10 per cent voltage drop will reduce the power of the motor about 20 per cent, and the speed of operation will drop considerably. With a voltage increase, there will be an increase also of the current input and the speed of the tool, and this may overheat the motor.

Table 1 lists the correct wire sizes for extensions to 115 volt-tools. For 220-volt tools the wire size should correspond to an extension length on the table twice the contemplated length.

Brushes, the major cause of tool trouble, are sliding contact carbon blocks riding on the commutator of the motor armature. The armature is rotating at a high speed, and there is considerable friction between the brushes and commutator, causing the

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For more facts, use Request Card at page 18 and circle No. 532

STEPHENS-CANFIELD AUTOMATIC CURBER MODEL 56-W

STEPHENS-CANFIELD AUTOMATIC CURBER MODEL 55A

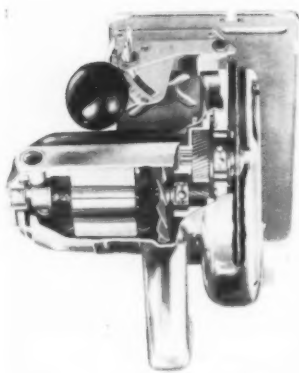
BEGINNING WITH THIS ISSUE, new product announcements are being grouped in a special section called Product Parade (see page 121). For further information on any item in the section, circle the designated number on the Request Card that is bound in at page 18.

brushes to wear away. Short armatures relieve tension on the spring that presses them against the commutator, causing arcing, which in turn burns the brush and commutator and ruins the armature.

Brushes should be replaced when excessive sparking shows up or when they have worn down to 3/16 inch. A new brush is less expensive than replacing or repairing an armature.

Improper brush contacts result in corroded, greased, pitted, and worn commutators. Commutators can be cleaned with very fine sandpaper, but never with an emery cloth.

Switches, the elements of the electric circuit that make and break the connection from the line to the motor, must have an electrical rating sufficient to carry the full load



Cleaning and lubrication are the important jobs that have to be done regularly if heavy-duty saws like this Black & Decker No. 73 model are to operate at top efficiency.

current of the motor. It also must withstand the larger current that is momentarily in effect when the electric circuit is closed to start the tool.

When the motor is stalled, the switch should be opened only when necessary. The switch contacts are subject to very high current when they are opened, and this may burn the contacts. Poor contacts can make the switch stick, which is dangerous while the tool is running. A switch with its contacts in good condition may stick or appear to be burned out because the operating mechanism has been damaged. Since they are inexpensive, it is not worth while to repair them.

The possible causes of motor trouble and the remedies are listed in Table 2, which was prepared by the

Electrical Tool Institute for use by the National Safety Council. When ordering parts from the manufacturer, give the complete nameplate data and number of the part. If such information is missing, the old part should be returned.

Factory servicing

From time to time, according to the usage, a portable electric tool may need factory service. Factories that do this work, located throughout the United States and Canada, have special tools and specialized mechanics for correctly servicing equipment. It is wise to consult these branches for major repair work and extra parts.

Depending on the importance of the tool and the volume of work, it is advisable to consider a stand-by in case a tool breaks down. A stand-by can be put on the job immediately, eliminating work stoppage or the substitution of an inadequate method to perform the same job. The defective tool can then be fully and carefully repaired and put back on the job in the shortest possible time.

THE END

Engineering in frost area subject of MIT program

Soil engineering in frost areas is the first topic to be discussed at the special summer program of Massachusetts Institute of Technology. School will be held for 5 1/2 hours each day starting June 11 through 21. Mornings will be devoted to presentation of topics by the participating staff; and afternoons will include open discussions and occasional field trips or demonstrations.

The topics to be presented include engineering implications of glacial geology; frost problems in Canada; principles of heat flow; principles of soil freezing and frost action; frost-susceptible soils—laboratory and field frost tests; soil stabilization; design and construction of pavements, embankments, walls, and foundations; and review of frost problems associated with highway design and construction. Tuition for the course is \$250.

More information about this course can be obtained from Office of the Summer Session, Room 7-103, Massachusetts Institute of Technology, Cambridge 39, Mass.

Highway laws studied in new HRB bulletin

Bulletin 145, "Highway Laws", available from the Highway Research Board, discusses a bill to revise federal-aid highway laws; state highway officials and laws; highway and municipalities laws; and the county's point of view on highway laws.

The highway laws of Louisiana, Nebraska, Rhode Island, and Michigan are detailed. The concluding chapter contains a progress report of the work of the Highway Laws Project staff and the most significant judicial decisions of 1955.

Priced at \$1, the bulletin is available from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C.

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EERS



Scale barge, linking levee to cement barge, facilitates fast unloading operation with Payloader.

Case history

Apt use of loader cuts material costs

The inventive use of its Payloader in a recent material transport operation realized a large savings in every area of the project's cost, according to a report from Barber Bros. Co., Baton Rouge, La.

The firm, constructors of soil-cement-base roads in the Baton Rouge area, formerly had taken its cement deliveries by rail only. Under the conditions dictated by that operation, the effectiveness of the loader was limited to moving the material from the rail cars to a conveyor that carried it to a bin. From the bin it flowed by gravity into trucks on the scale below.

The new method employed a scale barge moored to a levee which was accessible to trucks by a plank road. A 100x30-foot single cement barge was floated in and moored alongside the scale barge. The firm's Payloader was then able to swing material directly from its primary container into the trucks standing on the scale barge.

Because of the comparative economy of barge transport and the overall simplicity of the unloading operation, the contractor states, this method is now used wherever transport by water is available to the job.

For further information about Payloaders, write to The Frank G. Hough Co., Dept. C&E, 822 Seventh Ave., Libertyville, Ill.

Circle No. 205.

Dredging underway in Great Lakes route

The U. S. Army Corps of Engineers has started a \$136 million dredging job to bring the Great Lakes within reach of 80 per cent of the world's ocean-going cargo ships. Deepening the connecting channels will take until about 1962. A total of 44 million cubic yards of earth will bring the channel dredging to 27 to 30 feet, and this will complete the St. Lawrence Seaway, even though the project is not part of the seaway.

The first channel to be dredged is at Amherstburg, Ontario, in the Detroit River. This \$23 million job, requiring 3 million yards of ledge rock and dirt to be cleared away, will be finished by 1960. Other channels to be dredged are in the Detroit River, Lake St. Clair, the St. Clair River, the Straits of Mackinac, and St. Mary's River.

JUNE, 1957

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Reversible tramming motors enable the Tracdri to whip into reverse, go forward and pivot . . . have "dead man controls" for greater safety.



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A close-up of Ashbak's shop-made joint cleaner, which operates in the dry.

A welder applies Stoodly tube borium to the teeth of the cutting blade. ▶



Case history

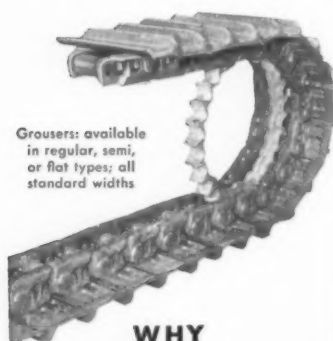
Hard-facing of saw blade cuts joint maintenance costs

The application of an alloy developed by the Stoodly Co. to an ordinary coarse-toothed circular saw blade is

said to have reduced the total cost of a highway maintenance job by more than \$10,000 for a Minnesota contractor.

In areas where winter months are wet and cold, expansion joints in concrete highways are especially susceptible to deterioration from moisture, dirt and other foreign agents in the joint substance. The resiliency of the joint is lessened, which in turn hampers natural expansion and contraction and results in buckling and cracking. As routine maintenance, joints are periodically cut out and re-packed with a semi-plastic asphalt-type material which seals out moisture and dirt, yet permits the pavement to "work".

Faced with such a job, the Ashbak Construction Co. of St. Paul designed a light machine for joint cleaning that is said to permit a most economical maintenance operation. Employing a single operator, their machine equals the footage of two conventional machines attended by four men. The operating cost of the Ashbak unit is approximately \$85 a day including blade maintenance and labor. Daily expenses for a conventional unit would average about \$320, the contractor estimates, and it would have



Grousers: available in regular, semi, or flat types; all standard widths

WHY Kensington track LASTS SO LONG

There are two reasons why these tracks give you longer service, even under severest working conditions: (1) KENSINGTON's new, improved design, and (2) superior, wear-resisting alloyed manganese steel.

New Design. Rigidity and near-perfect alignment are made possible by one-piece rail design and special heat-treated alloy pins pressed tightly in place under high pressure. Anti-shear lugs on grouser plate fit snugly over tie bar of link to eliminate loose plates, elongated bolt holes, twisting, weaving, and side-sway... the most common causes of bolt loosening and track trouble. Grousers are heavy-duty at all critical points to better resist bending and breaking.

Yet, despite all these improvements, KENSINGTON Track Assemblies fit all standard, popular make crawler tractors.

Steel with Stamina. Special, hard, tough, KENSINGTON-developed alloyed manganese steels actually fight back against wear! They constantly develop extra surface hardness when exposed to friction, abrasion, and impact.

KENSINGTON tracks come from the factory ready-assembled, easy to install.

Discover for yourself how much KENSINGTON tracks will lower your maintenance costs and improve your operating efficiency. Coupon will bring details.



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Dept. A, 505 Kensington Ave., Chicago 28, Ill.

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Make of tractor _____ No. tracks _____

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Width of grouser _____

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COMPANY _____

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STATE _____

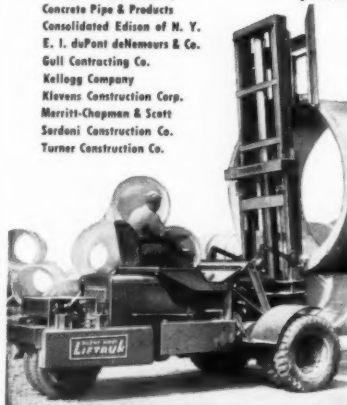
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CAPACITY

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eliminates overloading
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No doubt about it—Mercury Clutches increase the efficiency of gasoline-powered equipment enormously. You'll never regret the day you insisted on Mercury Clutches. Make that day—today.

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taken ten of these to do the job performed by only five of Ashbak's one-man machines.

Much of the economy of this operation is due to the design of the cutter wheel. The saw blade is hard-faced with Stooddy acetylene tube borium of 8 to 10 mesh particle size.

These 12-inch-diameter blades are first torch-cut from 3/8-inch carbon steel plate. The arbor hole is then drilled, and the teeth are hard-faced. To complete the twelve teeth on a new blade only one 1/4-inch-diameter borium rod is required.

In the field, a single welder refacing blades can keep six machines in constant operation. Repeated applications of tube borium are good for an average of 130 feet to 150 feet of

joint cutting. This figure is from two to three times higher than for any other hard-facing material tried, and all types were experimented with during the design period.

Faster cutting and more footage are but part of the story, however; a more important accomplishment has been the thoroughness of joint cleaning. Consistently rating 100 per cent approval on inspection, work completed is of a caliber that Ashbak feels is likely to influence future highway contract specifications.

For further information on Stooddy hard-facing and its applications, write to the Stooddy Co., Dept. C&E, 11936 E. Slauson Ave., Whittier, Calif.

Circle No. 123.



Stanley C. Hope, left, president of Esso Standard Oil Co., presents a \$10,000 check for the five scholarships to Dr. Kent T. Healy, chairman of Yale's Committee on Transportation. Looking on is Frederick W. Hurd, director of the Bureau of Highway Traffic.



This Jaeger 2PN pumps 10,200 gph through a 2" suction line—all the water a 2" hose can handle. With 2 1/2" hose, it pumps 14,400 gph.

Big New Capacities in Jaeger Pumps

Tests of latest model Jaeger "Sure Prime" centrifugals, reproducing actual job conditions, establish new high capacities and performance never before guaranteed to users. For example, a light Model 3XP now pumps 19,500 gph at 10' static suction lift, the Jaeger 6P pump now has an actual performance exceeding 100,000 gph. Base your pump buying on latest information. Sizes 1 1/2" to 10". See your Jaeger distributor or write for catalog.

THE JAEGER MACHINE CO., 701 Dublin Avenue, Columbus 16, Ohio

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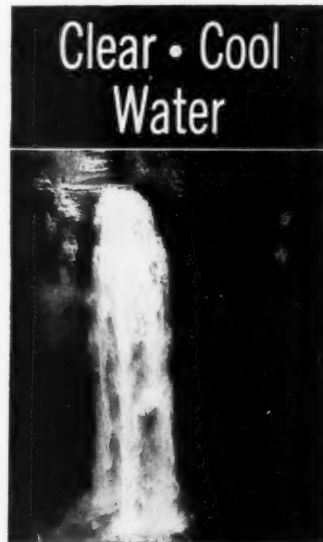
For more facts, use Request Card at page 18 and circle No. 539

Highway dept. fellowships started by Esso Standard

Five \$2,000 fellowships to graduate engineers for study at Yale University's Bureau of Highway Traffic has been established by the Esso Safety Foundation of the Esso Standard Oil Co., New York, N. Y. The fellowships, open to graduate engineers working toward advanced degrees, are granted to candidates selected by Yale from the 18 eastern and southern states and the District of Columbia where Esso Standard operates. The awards cover tuition, a monthly living allowance, and a fund for individual research projects.

Esso has also established a Highway Traffic Department to coordinate the firm's long-range studies and programs in the traffic safety and highway development fields. The new department will sponsor highway-safety research, education, enforcement, and engineering projects.

John J. Hall has been named manager of the department, and Harry J. Green has been appointed assistant manager.



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MODEL RL-85 Lightweight CON-CUT

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MODEL SP-300 Self-Propelled CON-CUT

- Designed for up-cut action which increases blade life and gives smoother operation. Exclusive CON-CUT TORQUE converter drive means faster cutting with less blade wear.

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Road sign repair bill going up, up, up

Neglect and chloride salts for de-icing expected to take annual toll of \$200 million for highway sign maintenance

With the nation preparing to build a 41,000-mile network of modern superhighways linking 42 state capitals and 90 per cent of our cities, rust costs on stop signs and traffic signal posts alone are expected to rise from about \$20 million annually at the present time to about \$200 million an-

nually when the new road system is completed.

This estimate appears in a joint report by the University Research Corp. and the Rust-Oleum Corp., manufacturer of rust preventive coatings.

Neglect is said to be partly re-

sponsible for this condition, but the widespread use of chloride salts for de-icing highways is also blamed for the increasing toll taken by rust.

According to the report, nothing corrodes metal like salt in the presence of water and air. The salts used on the highways, when dissolved and spattered over neglected metal highway signs and traffic signal posts, literally eat pits in the steel surface, weakening the structure many times more than if the rust occurred over the entire surface in a uniform layer.

Three to seven-year life

There are about 800,000 highway bridges in the United States, the report indicates, and at least half of them have stop signs at one intersection or another. There are another 1,350,000 highway crossings, with most of them having stop signs. In addition, there are estimated to be another 1,200,000 highway signs carrying such legends as "Speed Limit, 65 M.P.H.," or in the villages and townships, such signs as "School, Proceed With Caution," or "Slow, Bad Corner." Finally, there are another 760,000 traffic signal lights in operation.

If the average cost of each new sign is \$10, and of each traffic light is \$100, total cost is about \$29½ million for the signs, and \$76 million for the traffic lights.

About half of these get some paint protection from year to year, and as a result, this half lasts about seven years on the average, the Rust-Oleum report says. The other, uncared-for half lasts somewhat less than three years on the average—and in some parts of the country such as the southeast and the Gulf cities, the typical traffic sign, if not repainted twice a year, will last no more than one year.

Annual loss due to rust of highway signs and traffic lights alone is calculated by the University Research people at about \$20 million. The new highway program, when completed as to roads, highway signs, and traffic lights, is expected to increase this rust loss 10 times, or to about \$200 million per year.

THE END

Eimco appoints Lloyd

Kenneth D. Lloyd has been named Intermountain field service engineer for the Model 105 tractor division of Eimco Corp., Salt Lake City, Utah. Lloyd will cover Utah, Idaho, Montana, Wyoming, Colorado, Nevada, and Arizona, instructing operators and owners of the Eimco Model 105 tractor-excavators, bulldozers, and front-end loaders, in proper maintenance and operational procedures.

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easily installed, rugged,
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Product LITERATURE

For further information on any of the literature described in the following section, circle the designated number on the Request Card at page 18.

Transit mixers

Descriptive literature on the company's truck-engine-drive Transconetes is available from Construction Machinery Co.

The brochure especially features the company's power connector unit. The principle of this unit is the transference of power from the front of the engine to a special unit in the drum drive, with no separate mixer engine required. The entire assembly is said to be adaptable to a variety of trucks. Better all-round job performance and increased savings in fuel are among the many advantages claimed. Actual photographs and sketches illustrate the text.

Construction Machinery Co., Dept. C&E, 447 Vinton St., Waterloo, Iowa.

Circle No. 109.

Dump bodies

Descriptive sheets on Daybrook Series 805, 950, and 1050 dump bodies are available from L. A. Young Spring & Wire Corp. The literature includes details on construction features, gages of metal, and dimensional data on bodies and understructures.

L. A. Young Spring & Wire Corp., Daybrook Hydraulic Div., Dept. C&E, Bowling Green, Ohio.

Circle No. 162.

Hydraulic crane

A complete case history showing how one contractor has benefited from the use of an Austin-Western hydraulic crane is available from the Baldwin-Lima-Hamilton Corp.'s Austin-Western Works.

Written by the contractor himself, this report details the company's experience before and after purchasing the hydraulic crane, and shows how the use of this machine has cut costs in both construction and maintenance operations. Itemized costs are given showing the savings effected with this piece of equipment in this contractor's experience.

Austin-Western Works, Construction Equipment Division, Baldwin-Lima-Hamilton Corp., Dept. C&E, 601 Farnsworth Ave., Aurora, Ill.

Circle No. 4.

Tractor-shovels

An illustrated booklet describing its latest crawler tractor-shovel units is offered by the J. I. Case Co. The featured TerraTracs are the Model 800, an 80-hp unit available with either gasoline or diesel engine, and

the Model 1000, a 100-hp diesel only, with bucket capacities of 1½ and 2 cubic yards, respectively.

One of the features emphasized in the booklet is improved maneuverability due to the TerraTrac counter-rotating transmission, which provides independent power control of each track in both speed and direction.

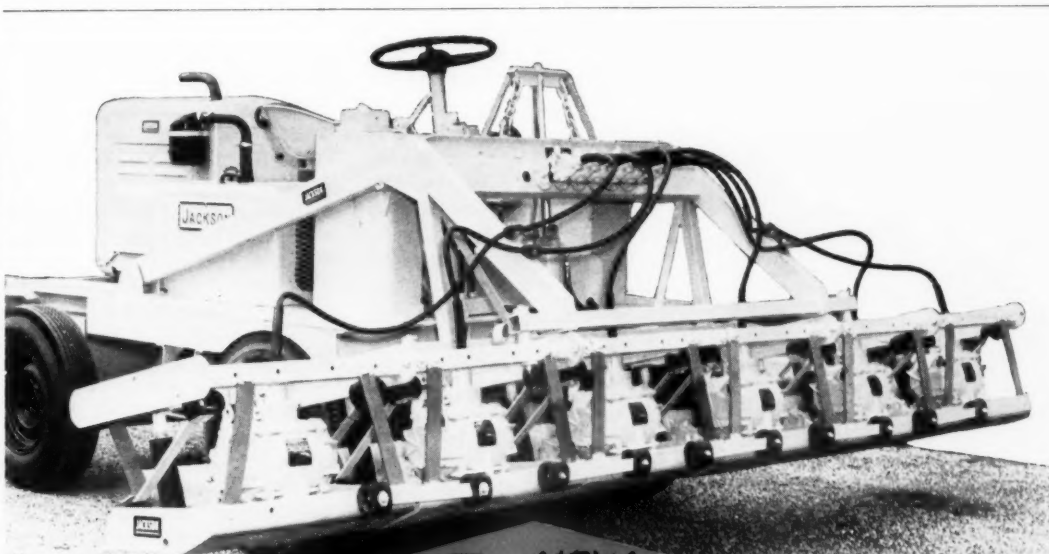
Higher work speeds and higher truck clearance are among the other features stressed. Specification tables and operating dimensions are included.

J. I. Case Co., Dept. C&E, Racine, Wis.

Circle No. 117.

Off-highway trucks

Literature describing the two models of its Payhauler is available in Booklet CR-592-G from International Harvester Co. Speed, capacity and dependability of the 24-ton model 95 and the 18-ton model 65 are discussed, and on-the-job reports are in-



The NEW JACKSON VIBRATORY COMPACTOR

HAS MUCH MORE POWER and
SPEED . . . UNMATCHED ADAPT-
ABILITY TO JOBS OF ALL TYPES!

Here's the machine that will give you maximum density of all materials normally used in macadam base courses and sub-bases with the greatest economy and convenience.

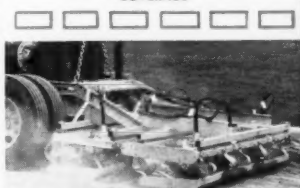
It's a vastly improved version of the Jackson Multiple Compactor which was used with great success on virtually all the nation's important paving projects. It is much more powerful and faster, providing time-saving, full course, single pass compaction. And unmatched as it is for quick and easy adaptability to jobs of all types, it will handle each of them with greatest convenience and least lost motion. Moreover, with this machine you can get into places others can't reach. By all means see your nearby Jackson Distributor (name on request) about this machine or write to us for the complete facts before buying any compactor.

ANY ARRANGEMENT DESIRED OF VIBRATORY UNITS IN THE WORKHEAD TO FIT THE JOB MOST ADVANTAGEOUSLY IS QUICKLY AND EASILY ACHIEVED.

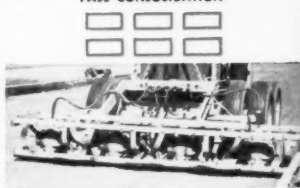
JACKSON VIBRATORS, INC.
LUDINGTON, MICHIGAN



6 UNITS ABREAST FOR MAXIMUM COVERAGE



6 UNITS IN TANDEM FOR MAXIMUM ONE PASS CONSOLIDATION



4 UNITS (or it might be 5) TO EXACTLY FIT JOB WIDTH REQUIREMENTS



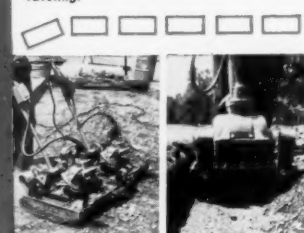
5 UNITS IN TANDEM AND STAGGERED. VARIABLE FOR A WIDE RANGE OF WIDTHS.



4 UNITS TOWED AT SIDE OF TRACTOR. IDEAL FOR ONE PASS WIDENING OPERATIONS.



SHOULDER COMPACTION IS AUTOMATIC. End unit automatically assumes this position — no adjustment required. Prevents raveling.



AND FOR SPOTS OTHERS CAN'T REACH.

Any of the compacting units in the Jackson Vibratory Compactor workhead can be fitted with operating handle and used exactly like the nationally renowned Jackson Manually Guided Compactors. Perfect for getting into odd spaces and close to walls, etc. — spots that can't be reached by other equipment. One man with a twin hookup of two of these units will compact up to 1,200 sq. yds. of granular soils in 6" layers per hour.

For more facts, use Request Card at page 18 and circle No. 546

Product Literature

cluded. The pamphlet is illustrated with photographs of the units on road and quarry operations. General specifications of both units are given.

International Harvester Co., Construction Equipment Div., Dept. C&E, 180 N. Michigan Ave., Chicago 1, Ill.

Circle No. 149.

Small truck shovels

A booklet describing the advantages of its line of small crane-shovels is available from Quick-Way Truck Shovel Co. The literature features the firm's 8½-ton Model 85A, a 4/10-yard unit powered by an International

Harvester U-175 47-hp engine. Special attachments available from the manufacturer are said to make the machine a highly versatile piece of equipment.

The booklet contains photographs and general dimensions of the crane-shovels.

Quick-Way Truck Shovel Co., Dept. C&E, 2401 E. 40th Ave., Denver, Colo.

Circle No. 186.

Engineering instruments

A completely revised catalog of its engineering instruments is available from the W. & L. E. Gurley Co. Every instrument manufactured by the company is listed and described. The 72-page text is illustrated with both drawings and actual photographs.

Recent models of instruments, such as the optical plummet transit, are given detailed description, as are many of the features of instruments such as reversion levels, variable-power eyepieces, and covered glass reticles.

The catalog includes sections on transits, levels, leveling and stadia rods, topographic instruments and equipment, compasses, field supplies, and current meters. Information on how to order and on repair service is also supplied.

W. & L. E. Gurley, Dept. C&E, Troy, N. Y.

Circle No. 115.

Free subscription

Free subscriptions to its new quarterly magazine, the Gar Wood-Buckeye Construction News, are offered by Gar Wood Industries, Inc.

The new publication will feature

"Whom shall I say is calling?"



on-the-job stories describing interesting construction techniques, explanations of unusual equipment applications, and a regular service feature offering tips on such as how to increase the life of construction equipment.

Customer Service Dept., Gar Wood Industries, Inc., Dept. C&E, 36253 Michigan Ave., Wayne, Mich.

Circle No. 215

Executive planes

A folder describing several models in the company's line of business aircraft and quoting from a number of satisfied users is available from the Beech Aircraft Corp.

Four, six, and eight-passenger models are pictured, and safety features of these business airplanes are discussed.

Beech Aircraft Corp., Dept. C&E, Wichita, Kan.

Circle No. 130.

Diesel repair

"Principles of Trouble Shooting for Cummins Diesels" is the title of a new folder available from Cummins Engine Co. The bulletin is designed to unfold so that it can be used as a wall chart on which complaints and probable causes are noted.

The chart includes some of the most common complaints that may be encountered during the service life of a diesel engine.

Service Division, Cummins Engine Co., Inc., Dept. C&E, Columbus, Ind.

Circle No. 136.

Bituminous paver

An eight-page bulletin, Form No. 655-2, describing the new Vibromatic bituminous paver has been issued by Pioneer Engineering Works, Inc.

In addition to describing the Vibromatic principle and the results obtained with it, the bulletin contains complete specifications, dimensional

COMPACTION for a FRACTION



with "JAY" TAMPERS

NOW Get engineer proved uniform high densities at lowest possible per mile.

NOW "JAY" is the only machine on the market with proved maintenance cost of 80c per month per machine.

NOW One machine does all the tamping, large jobs as well as small. Maximum compaction in ditches, roadbeds, cross cuts, airstrips as well as all the hard to get at places.

NOW You can buy six "JAYS" at the price you would pay for one piece of most other equipment and no lines or hose to get tangled in the job. Be sure to see the "JAY" Model 36 too. Perfect for the larger areas and bigger jobs.



"JAY" Model 36

See your nearest dealer or contact
The "Jay" Company,
Columbus, Ohio.

THE "JAY" Company

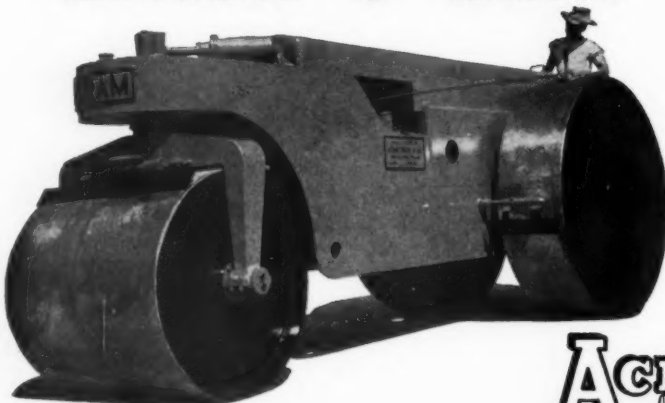
170 Mosack St., Columbus 7, Ohio
Please send me additional information on the "JAY" TAMPER

My Name _____
Street _____
City _____ Zone _____ State _____

For more facts, use coupon or circle No. 547

INGRAM

with NEW REVERSE - O - Matic



Ingram rollers with the reverse-o-matic drive permits no-stop power shifted reversing. Reverse-o-matic can be shifted while the roller is moving, therefore there is no delay for clutching or shifting gears. There is no maintenance required, no adjustments to be made and no clutches to replace. The reverse-o-matic furnishes smooth shockless power that reduces engine wear and prolongs life of other power transferring mechanism.

All these advantages show that an Ingram roller equipped with "Reverse-o-Matic" furnishes the most practical roller you can use.

See and get the facts on Ingram before you buy your next roller.

Acme IRON WORKS
P.O. BOX 2020 • SAN ANTONIO 6, TEXAS

For more facts, use Request Card at page 18 and circle No. 548

CONTRACTORS AND ENGINEERS

drawings, and numerous photographs. Pioneer Engineering Works, Inc., Dept. C&E, 3200 Como Ave., Minneapolis, Minn.

Circle No. 56.

Loader operation

An instruction folder on the operation of its Model 105 front-end loader is offered by the Eimco Corp. The information contains specific directions for safe and effective operation of the machine, as well as a detailed coverage of its proper maintenance.

The Eimco Corp., Dept. C&E, 654 S. Fourth West St., Salt Lake City 10, Utah.

Circle No. 209.

Clamshell buckets

The Industrial Brownhoist Corp. has available a specification folder describing several of that company's clamshell-type buckets. Capacities, weights, and dimensions for the buckets are given.

Industrial Brownhoist Corp., Dept. C&E, Bay City, Mich.

Circle No. 85.

Elevating scraper

Descriptive literature containing detail illustrations and complete specifications of its elevating scraper is available from the Hancock Mfg. Co. Information on both the 40-hp 5-yard model and the 50-hp 8-yard model are given.

Hancock Mfg. Co., Dept. C&E, P. O. Box 1359, Lubbock, Texas.

Circle No. 14

Highway widener

A new catalog covering the Gar Wood-Buckeye Hi-Way Widener is available from Gar Wood Industries.

The literature illustrates how the widener excavates and finish-grades a highway-widening trench in one pass. Requiring only one man to operate, the Gar Wood-Buckeye Hi-Way Widener digs a clean, flat-bottomed trench, ready for concrete or bituminous material.

Gar Wood Industries, Inc., Dept. C&E, 36253 Michigan Ave., Wayne, Mich.

Circle No. 86.

Scrapers, bottom-dump

Specification sheets on three scrapers and a bottom-dump are available from the Euclid Division of General Motors Corp. The scrapers are the 21-cubic-yard SS-18, the 27-cubic-yard SS-24, and the 27-cubic-yard TS-24 twin-power model. The bottom-dump is the S-12, a 19-yard overhung-engine model. The descriptive sheets include pictures of the models, details of operation, and full specifications.

Euclid Division, General Motors Corp., Dept. C&E, 1361 Chardon Road, Cleveland 17, Ohio.

Circle No. 19.

Batch plants

A booklet describing its Model R-M line of semiportable asphalt batch plants is offered by the Standard Steel Corp. These new models are obtainable in sizes ranging from 2,000 to 6,000-pound batch capacities, according to the literature. Numer-

ous layout possibilities for each plant size is one of the features stressed. Road Machinery Division, Standard Steel Corp., Dept. C&E, 5001 S. Boyle Ave., Los Angeles 58, Calif.

Circle No. 135.

Form protection

Descriptive literature on its protective coating for plywood is available from L. Sonneborn Sons, Inc. Called Form-Saver, the product is said to minimize swelling action of water and lime, permit repeated use of forms before recoating, assure smoother and cleaner concrete surfaces, and prolong the useful life of forms.

L. Sonneborn Sons, Inc., Building Products Div., Dept. C&E, 404 Fourth Ave., New York 16, N. Y.

Circle No. 150.

Use the Request Card at page 18 to obtain any of the literature described in this section.



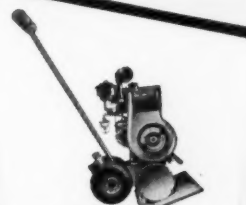
NEW EARTH COMPACTION RECORDS SET...



...by "JAY"!

Contractors Report up to 12,000 square feet per hour of high density compaction at a saving of 20 to one over old tamping methods. Moving at speeds of up to 70 feet per minute the "JAY" 36 delivers 2300 three thousand pound impacts per minute to properly keyseat and compact all types of materials.

Completely self contained and one-man operated the "JAY" 36 needs no lines, hoses, or expensive auxiliary equipment. Engineer recommended and contractor approved, the "JAY" 36 is the perfect companion and "big brother" to the already famous "JAY" Model 12.



"JAY" Tamper Model 12

See your nearest "JAY" Dealer or contact the "JAY" Company, Columbus 7, Ohio

THE "JAY" Company

170 Monck St., Columbus 7, Ohio
Please send me additional information on the "JAY" TAMPER

My Name _____
Street _____
City _____ Zone _____ State _____

For more facts, use coupon or circle No. 550

Specify VULCAN FOR YOUR PAVEMENT BREAKING TOOLS

VULCAN manufactures a complete line of top quality tools for the toughest pavement breaking applications known. VULCAN tools are designed to meet today's construction demands where the use of more powerful hammers requires better tools—where work deadlines must be met—where equipment must be the best.

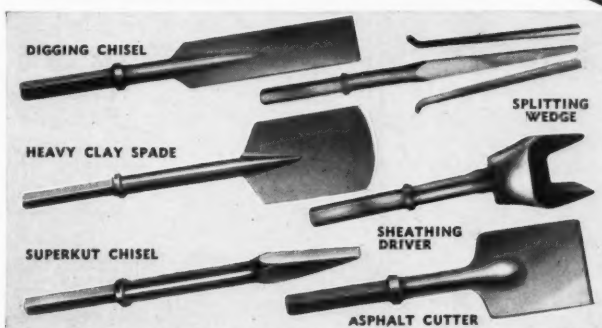
Not only do Vulcan tools offer absolute dependability and satisfaction at lowest possible cost, but their toughness and unexcelled performance are VULCAN extras that you get at no added cost.

Why not test the rugged strength and durability of VULCAN tools today?

Specify VULCAN for:



VULCAN TOOLS are sold by distributors throughout the United States and Canada.



PAVEMENT BREAKING TOOLS
CLAY DIGGING TOOLS

DRILL STEELS
PNEUMATIC HAMMER TOOLS

ELECTRIC HAMMER TOOLS
HAND TOOLS FOR CONCRETE, STONE, AND STEEL WORKERS

VULCAN TOOL MANUFACTURING COMPANY
41 LIBERTY STREET, QUINCY 69, MASSACHUSETTS

Specialists in the Design and Production of Pneumatic Tool Accessories

For more facts, use Request Card at page 18 and circle No. 549

Drilling machines

A pamphlet describing its drilling equipment is available from the Acker Drill Co. Units ranging from portable, hand-operated soil sampling tools to power-driven equipment capable of drilling to depths of 800 feet are described and illustrated.

One of the models featured is the AP all-purpose digger. Portable, and hydraulically driven, its functions include the setting of guard rails and fence posts, soil sampling, driving pipe, foundation test boring, and highway test core drilling. Capacities for all units are supplied.

Acker Drill Co., Inc., Dept. C&E,

721 West Lackawanna Ave., Scranton, Pa.

Circle No. 132.

Water repellent

A brochure on the properties, applications, and advantages of Spellbar water repellent for concrete bridge and highway protection is available from the Silicones Division of the Union Carbide & Carbon Corp.

According to the literature, Spellbar is a specially designed silicone resin which substantially increases the serviceable life of concrete by reducing the amount of water that can be

absorbed by the surface.

Silicones Division, Union Carbide & Carbon Corp., Dept. C&E, 30 E. 42 Street, New York 17, N. Y.

Circle No. 24.

Rubber-tire equipment

A booklet describing its Michigan line of rubber-tire construction equipment is available from the Clark Equipment Co. The brochure features several models of the firm's dozer, loader, scraper, and excavator-crane units. The excavator-crane machines are available both in rubber-tire and crawler-type traction.

On-the-job photographs and sketches illustrate the text, and general specifications are supplied.

Clark Equipment Co., Construction Machinery Division, Dept. C&E, Pipestone Road, Benton Harbor, Mich.

Circle No. 217

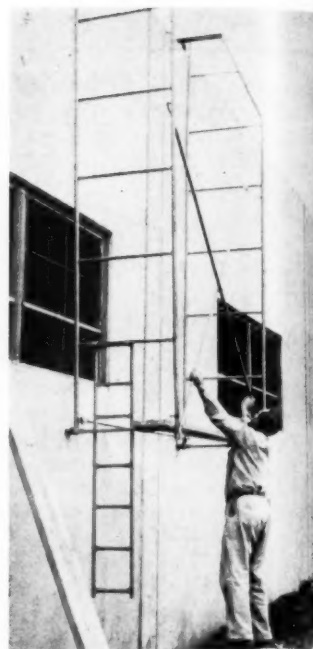
Versatile backhoe

Full details on Wain-Roy's backhoe for mounting on Payloader Models HU, HH, and HF, and International Model TD-6, TD-9 and 300 tractors are given in an illustrated catalog from the Wain-Roy Corp.

Such features of the attachment as its 190-degree working radius, powerful crowding feature, and high-speed operating cycles are pointed up. Many job photographs illustrate the backhoe on both Payloader and International models. Specifications are included for all models of the attachment.

Wain-Roy Corp., Dept. C&E, Hubbardston, Mass.

Circle No. 15.



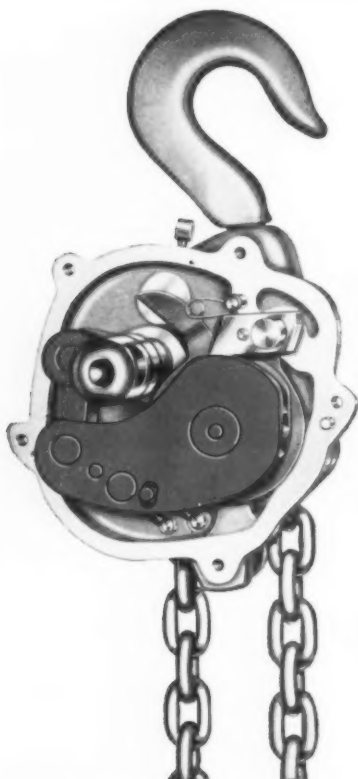
Case history: designed by Superior Scaffold Co. to specifications of Smith & Jex, Los Angeles concrete contractors, this new scaffold for tilt-up jobs is suspended from the wall and easily moved along by one man. The attached ladder and bottom plank make it easy to mount the scaffolding. A roller attachment at the top facilitates moving the scaffold while in place. Superior Scaffold Co., Dept. C&E, 5624 Bankfield Ave., Culver City, Calif. **Circle No. 67.**

Broom cores, levelers

Information about its rotary sweeper broom cores is obtainable in a price list from Van Brush Mfg. Co., Inc. The cores are available with or without fillers.

Descriptions and prices are given. Van Brush Mfg. Co., Inc., Dept. C&E, 327 Southwest Blvd., Kansas City 8, Mo.

Circle No. 181.



New Compound Levers

Make Coffing Super Powers the most efficient hoists in their class

Super Power hoists are designed around a new compound leverage principle. The levers, which replace the gears of conventional designs, enable workmen to raise loads with less handle pull than other hoists of the same capacities. Since use of the levers also reduces hoist size and weight, the workmen have 20% less weight to carry to the job.

Available in 1½ and 3 ton capacities in aluminum, and 1½ to 5 tons in malleable iron, Super Powers require little maintenance, since moving parts have sealed-in lubrication. Overload testing, "Safety Valve" handles, and constant load-locking ratchet and pawl assure safe operation. For complete details on these hoists, consult your Coffing distributor, or write to us for Bulletin L-3.



Coffing Hoist

DIVISION OF DUFF-NORTON COMPANY
810 WALTER STREET DANVILLE, ILLINOIS

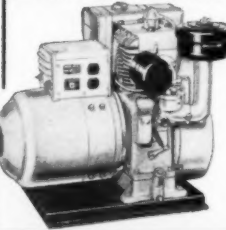
Ratchet Jacks, Screw Jacks, Hydraulic Jacks, Special Worm Gear Jacks, Ratchet Hoists, Electric Hoists, Load Binders, Spur Gear Hoists

For more facts, use Request Card at page 18 and circle No. 551

Power Plants Speed Construction USE POWER TOOLS—FLOOD LIGHTS

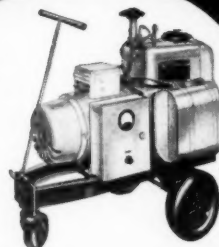
WINPOWER PORTABLE ELECTRIC PLANTS provide a dependable, low cost power source... speed up work performance by operating time and labor saving power tools. Wherever the job—whatever the need—you can count on a WINPOWER Electric Plant to meet your requirements.

A Different Size For Every Need



**800 WATTS
To 100 KW**

All Standard
Phases and
Voltages



These rugged, heavy-duty 3-wheel dollies are used as a permanent mounting for 3, 4, and 5 KW electric plants where portability is desired by contractors, bridge builders, mine operators, road constructors, railroads, cities and municipalities.

Trailer-Mounted Floodlight Unit

MAKE NIGHT HOURS PAY with NITE-HAWK

Four 80,000 c.p. flood lights raise to 8½ ft.—aim in all directions. Control panel has duplex receptacles for extension light and power tool lines—voltage regulator—circuit breakers—fused circuits.

Tows at highway speeds on heavy-duty trailer with leaf springs—retractable caster wheel. This is the finest, most flexible unit available. 5 KW, 115 or 230 Volt.

WRITE FOR LITERATURE AND PRICES

WINPOWER MFG. CO.
Dept. G-10 Newton, Iowa



For more facts, use Request Card at page 18 and circle No. 552

CONTRACTORS AND ENGINEERS

Motor grader

A catalog describing the company's Model Forty Five motor grader, a 120-hp unit, is available from Allis-Chalmers Mfg. Co.

Illustrated with drawings and on-the-job photographs, the catalog contains the specifications of the unit, as well as information about attachments and accessories that add to its versatility. Such features as the all-steel heavy-duty welded frame and Roll-away moldboard are stressed.

Allis-Chalmers Mfg. Co., Tractor Group, Dept. C&E, 951 S. 70th St., Milwaukee, Wis.

Circle No. 90.

Mobile drills

A new catalog describing its line of mobile drills is available from the Worthington Corp. The literature features the Blu-Coated process of applying a penetrating coating to Worthington drill parts, thus giving them built-in protection against rust and other wear.

The brochure describes wagon drills, self-propelled wagon drills, crawler-mounted rigs, and Blue Brute rotary compressors. A full cut-away drawing of a Blue Brute drifter is included.

Worthington Corp., Dept. C&E, Worthington & Harrison Aves., Harrison, N. J.

Circle No. 231.

Concreting equipment

Its complete line of equipment for concrete and bituminous paving, ready-mix production, and general construction is described in a new 24-

page general bulletin from Blaw-Knox Co.

On-the-job photographs illustrate the general descriptions of some 14 basic items of equipment. The bulletin, designated No. 2530, also lists numbers for other bulletins, describing specific equipment.

Blaw-Knox Co., Construction Equipment Div., Dept. C&E, 40 Charleston Ave., Mattoon, Ill.

Circle No. 160.

To obtain any of the literature described in this section, circle the indicated number on the handy Request Card at page 18.

Diesel starting system

An improved hydraulic starting system for diesel engines is reported in a booklet offered by the Detroit Diesel Engine Division of General Motors. The booklet contains sketches illustrating the working principle of the Hydrostarter.

Instant starting, dependability in extremes of climate, and easier maintenance are features stressed.

Detroit Diesel Engine Division, General Motors Corp., Dept. C&E, 13400 W. Outer Drive, Detroit 28, Mich.

Circle No. 105.

Lubrication fittings

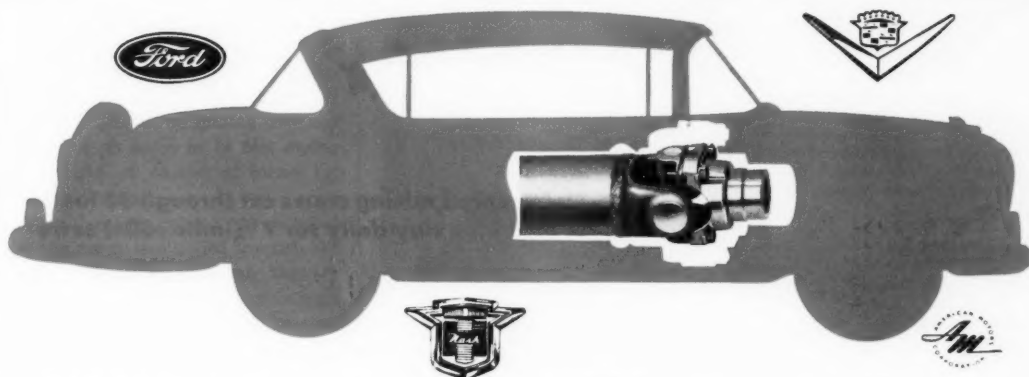
A complete catalog of its lubrication fittings is offered by the Alemite Division of the Stewart-Warner Corp. All fittings are described complete with individual dimensions ready for transfer to particular blueprints.

The catalog also lists replacement accessories such as bushings, elbow bodies, fitting extensions, plugs, tools, couplers, and nozzles, with specifications and dimensions.

Alemite Division, Stewart-Warner Corp., Dept. C&E, 1826 Diversey Pkwy., Chicago 14, Ill.

Circle No. 125.

FIRST



FIRST to make an Automobile Joint smaller—(3-9/16" swing diameter) to reduce the clearance needed by the low floor boards in modern cars.

FIRST to make the smaller joints stronger—(2500 lbs. ft. torque) to meet the needs of higher speed, higher power modern cars.

FIRST to make the smaller, stronger joints lighter—(20% less than other joints having the same torque capacity) to help designers keep overall weight down to modern standards.

FIRST to make the smaller, stronger, lighter joints easier to install—(less parts to handle) to save time and money on the assembly line.

Send a print and specifications of your new model for MECHANICS engineers' recommendations how you can give your next car the benefit of these four competitive advantages—provided by the new MECHANICS joint development.

MECHANICS UNIVERSAL JOINT DIVISION
Borg-Warner • 2030 Harrison Ave., Rockford, Ill.
Export Sales: Borg-Warner International
79 E. Adams, Chicago 3, Illinois

MECHANICS

Roller Bearing

UNIVERSAL JOINTS

For Cars • Trucks • Tractors • Farm Implements • Road Machinery •
Aircraft • Tanks • Busses and Industrial Equipment

DUDGEON

HYDRAULIC JACKS

**SALES
RENTALS**

**CAPACITY
TO
600 TONS**

FOR:
PILE
TESTING
UNDER-
PINNING
BRIDGES
PIPE
PUSHING
SOIL TESTING

**DESIGNERS and
MANUFACTURERS OF**

**Hydraulic Units
For Special
Applications**

**RICHARD
DUDGEON INC.**

789 BERGEN STREET BROOKLYN, N. Y.
• ST 9-4040 •

For more facts, circle No. 553

For more facts, use Request Card at page 18 and circle No. 554



men



A high degree of teamwork is demonstrated as the crew pushes the blue clay wall back. The miner at the heading handles a U-shaped knife that is pulled through the clay by a cable running through snatch blocks.



A miner passes a chunk of clay or "dog" to the line of muckers, to be passed on from man to man. The last man in line waits to toss the "dog" to the conveyor belt, which carries the clay about 15 feet and dumps it into a mining car. One of the cutting knives hangs in the foreground.

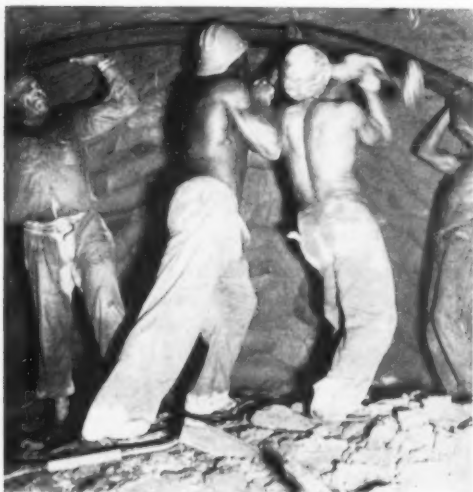


Mining crews work on two levels in the space just ahead of the Blaw-Knox tunnel forms. The crew on the upper level, working about 15 feet ahead of the other crew, throws clay to a conveyor supported by a plank platform.

Men supply the muscle for carving out big sewer

**Experienced mining crews cut through 48 feet
of stiff blue clay daily for 7½-mile relief sewer**

by **BILL ALLEN**,
field editor



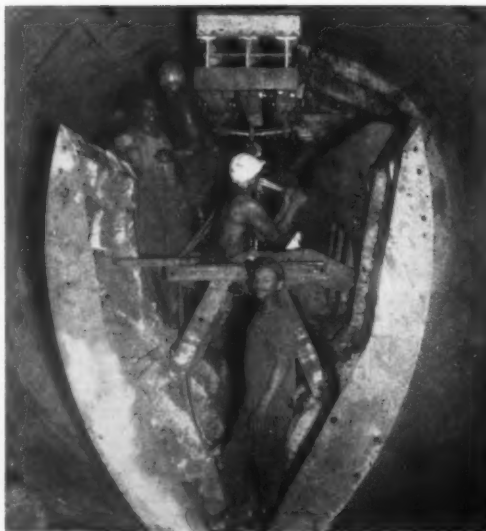
Strong muscles and strong backs are needed when it comes time to set the two arched sections of 4-inch H-beam that support the top half of the 15.5-foot-diameter tunnel. Wood lagging will be inserted between the H-beams, which are on 42-inch centers.

The job of cutting through stiff blue clay to complete the final section of a 15.5-foot-diameter relief sewer in downtown Detroit was a hand operation essentially, with success depending largely on the skill and stamina of mining crews.

Using knives and tugger hoists, these teams of men cut through as much as 48 feet of stiff blue clay in two shifts, leaving the day shift to

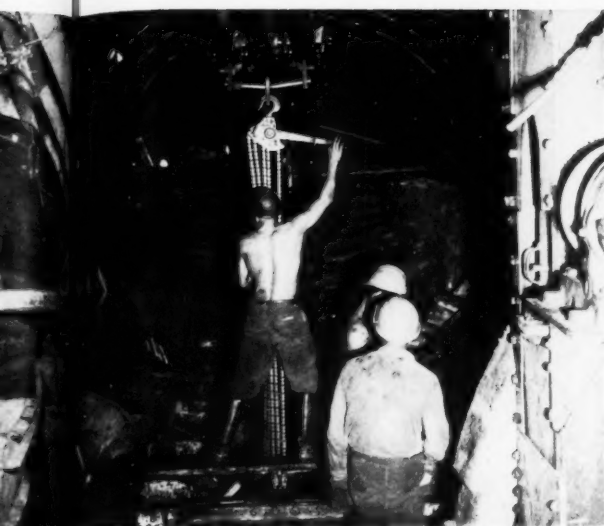
form and pour the concrete lining for the sewer.

Following a 7½-mile route along Conant and Mt. Elliott Avenues from Seven Mile Road on the north to its outlet in the Detroit River on the south, the sewer has an inside diameter of 15 feet, 6 inches for the 3.7 miles at the northerly end, while the remaining half is, in general, 16 feet 3 inches in diameter. Designed by the



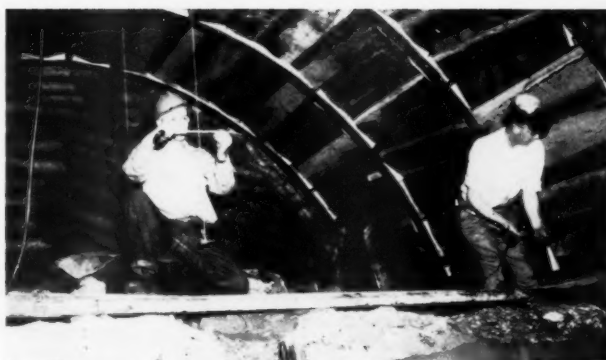
The invert section of a form, carried through the forms of the adjacent pour by the chain hoist at left, are being adjusted so that the 20-inch-thick walls of the tunnel can be poured. The arched H-beams and timber lagging supporting the top half of the tunnel are left in place.

The 24-foot Blaw-Knox forms are leapfrogged ahead as the tunnel is bored. The hinged invert section is folded here so that it can pass through forms that have to remain in place 24 hours to allow concrete to cure. Each form, averaging about 24 feet in length, is assembled from 4-foot lengths.



◀ Pulled through the forms of the previous pour, the hinged invert section is lowered into place at the heading.

The survey crew for the city of Detroit sets stakes to guide mining crews at the heading of the tunnel. ▶



City Engineer's Office of The Department of Public Works of the City of Detroit to relieve the overloaded storm and sanitary sewers in the northeast part of the city, the sewer flows on a grade of 0.04 per cent and averages about 45 feet deep from flow line to street level.

S. A. Healy Co. and Gargaro Co., Detroit, which completed the \$8 million contract this May, slightly more than a year after the March, 1955, starting date, still have about two months of cleanup work ahead.

Tunnel under pressure

Crews worked the two headings for the 15.5-foot sewer from a shaft at the center of the 3.7-mile route. To prevent settlement and to help hold back ground water, the contractor kept the tunnel under an average of 11 pounds of air pressure.

Air locks for men and for mining cars were located about 200 feet north and south of the shaft. Low pressure air lines, maintaining pressure in the tunnel, ran a short dis-

tance beyond the air locks, while an 8-inch high-pressure air line, a 4-inch water line, and a 6-inch blow line ran along the concrete wall of the tunnel to the headings.

Two mining crews work

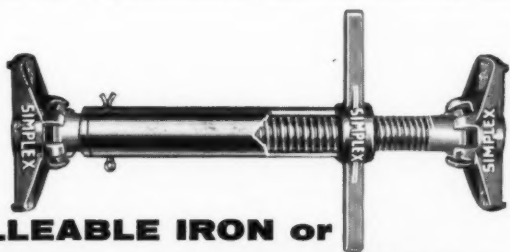
Crews worked a heading simultaneously with a bench method of mining, one crew cutting the top half of the tunnel and the other crew, working about 15 feet behind the top crew, cutting the bottom half.

Working hard, moving rhythmically, chanting "Get Along Little Doggies," the 27-man team made clay fly from heading to mining cars and advanced as much as 24 feet during two shifts—or 48 feet of tunnel for both headings.

The U-shaped cutting edge handled by the miner was pulled through the clay by a cable that ran through snatch blocks to an Ingersoll-Rand air-powered hoist. The operator controlling the hoist had to synchronize his operation with the work of the

(Continued on next page)

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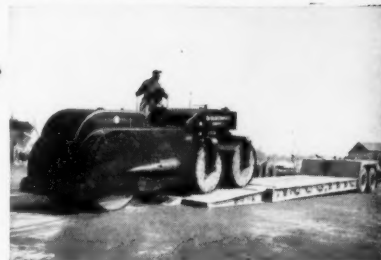
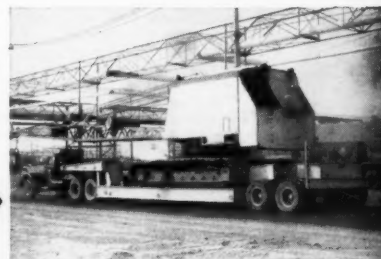
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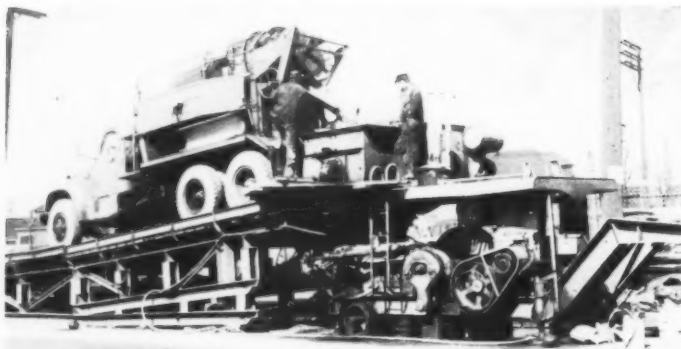


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The Pumpcrete method is used to get concrete to the forms. The ramp used by the Mack truck with Jaeger mixer is built in sections for easy transport. Concrete goes to an 8-inch pipe running through the shaft directly above the tunnel and is pumped along the side of the tunnel.

(Continued from preceding page)

miner. The chunks of clay were passed along by the miner and finally to a 15-foot conveyor that damped into the mining car that traveled to and from headings on 24-inch gage track supported by timber flooring.

The mining cars carrying excavated material from the heading were pulled by either a Mancha 5-ton or a Goodman 10-ton locomotive powered by batteries. Once the cars had passed through the air lock and into the shaft, they were picked up separately by a Koehring 509B crane on the surface and the loads dumped into Clement cable-dump trailers pulled by Mack trucks.

Bracing

The mining crews built the bracing of the tunnel as they cut their way forward. The main support for the top half of the tunnel consisted of two arched sections of 4-inch steel H-beams. These two sections were bolted together at the top to form a semicircle. The ends of the semicircular H-beam rested on two 8x12-inch wall beams that extend in 12-foot lengths along each side of the tunnel. Timber lagging in 42-inch lengths were inserted between the semicircular H-beams.

The lower half of support for the bracing was made up of concrete blocks about 1½ feet square and 7 inches thick. A row of blocks followed the contour of the bottom half of the tunnel. At its ends, it supports the wall beams, which in turn support the arched H-beams. The rows of blocks were placed about every six feet along the length of the tunnel. All bracing was left in place when the

concrete was poured.

The wall beams that followed along the spring line on either side of the tunnel extended ahead of the face of the heading through "monkey holes". The crew working the top half of the tunnel cut these holes out by hand. The 12-foot length of wall beam inserted in the hole afforded a footing for the overhead arch beams as they were set in place.

Stripping and forming

As the bracing was not designed to support the tunnel for a prolonged period, the 20-inch concrete tunnel lining, placed by the third shift, ran the length of tunnel that the previous two shifts had mined. Since the forms had to stay in place for at least 24 hours, the contractor needed 48 feet of forms to pour a 24-foot length each day. The extra 24 feet remained in place to support the previous day's pour.

In the forming operation, the rear 24 feet of forms was leap-frogged through the advance 24-foot section of forms and set to line and grade for the coming pour. The Blaw Knox steel forms were ingeniously designed to permit the rear section of forms to pass through the section remaining in place.

Basically, the forms consist of three parts: a box-like frame carrier that rides on rails within the circular form; a lower or invert section of the form that may be folded, much as a book closes; and an upper section formed in three hinged parts.

When forms were ready to be stripped, the upper section and the invert section were collapsed separ-

—For more facts, circle No. 557

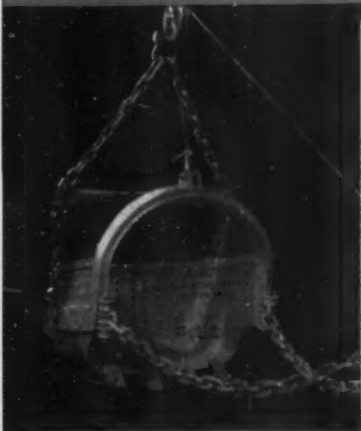
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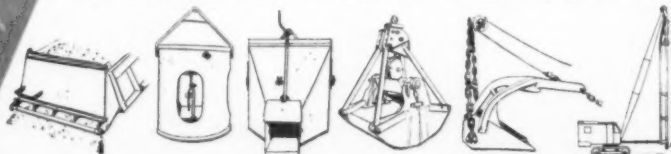
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CONTRACTORS AND ENGINEERS





An Easton 2½-yard muck car, delivered from the shaft, is picked up by a Koehring 509B crane and the load emptied into a waiting Clement cable-dump trailer pulled by a Mack truck. Hauling is done under a sub-contract by Charles G. Rogers of Detroit.

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ately and brought by the carrier through the forms remaining in place. One of the four air-powered hoists mounted on the carrier, used in the mining operation, was used to pull the carrier forward.

Concrete for lining

Concrete was pumped to the forms from the street through an 8-inch vertical pipe that was never more than 400 feet from the point of placement. At each heading, a double Rex Model 200 Pumpcrete machine delivered concrete to the forms through an 8-inch pipe. Ready-mix concrete, supplied by the Thomas E. Currie Co., Detroit, arrived at the Pumpcrete machine in Jaeger mixers mounted on Mack trucks.

The trucks backed up an approach ramp and chuted the concrete into the hopper of the Pumpcrete machine. Water, air, and telephone lines attached to the vertical section of the pipe ran from the tunnel to the top-side operation. The Pumpcrete machine and the ramp were moved forward at 400-foot intervals to a new access pipe as work on the tunnel

advanced. These vertical pipes also served as alignment holes, permitting engineers to check the position of the tunnel against known points on the street.

Concrete was placed through doors on the side of the cylindrical forms. When the level of the concrete rose above the doors, the concrete was pumped through the top of the open end of the form. It was necessary to use air pressure at intervals in the concrete pipe line to fill the arch. Then Ingersoll-Rand and Chicago Pneumatic vibrators were used both inside and outside the forms to consolidate the concrete.

Compressor house

The compressor house is located near the shaft in a garage adapted to house the big compressors. High-pressure air is supplied by two Chicago Pneumatic 300-hp compound compressors that have a 1,500-cfm capacity. Low-pressure air is supplied by two Ingersoll-Rand 100-hp compressors with a capacity of 900 cfm, and one Sullivan 150-hp unit.

(Concluded on next page)

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Overpass for side roads, New Hampshire Turnpike, Dover, N. H., State of N. H., owner. Landers and Griffin, contractors. Hayden, Harding & Buchanan, engineers. Photo by Zambella.

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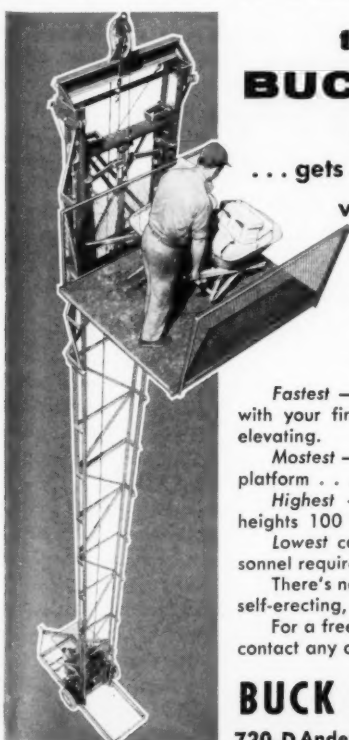


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(Continued from preceding page)

The compressors are driven by electric motors run off city power lines.

Sewer connections

Specially built wood forms were used in the steel tunnel forms to shape openings for connections to other sewers and to make access for man holes. Because the tunnel was under pressure, no connections or man holes were built as the tunnel was driven. This will be done later. The 4-foot-diameter man holes, constructed either of brick or precast concrete rings, will average about 25 deep.

Throughout the work, a city inspector tested the air in the tunnel every hour for dangerous concentrations of carbon monoxide, hydrogen

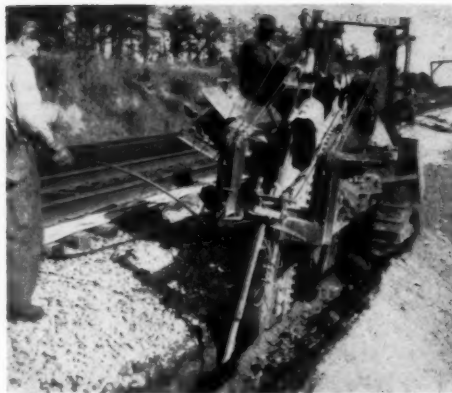
sulfide, and combustible gases. His test for methane is supplemented by an automatic alarm system at each heading that sounds when combustible gas enters the tunnel.

Personnel

Milton Wagnitz is city engineer for the City Engineer's Office of The Department of Public Works of the City of Detroit. William F. Herlihy is resident engineer, and John S. Percival is engineer of test and inspection. All heavy construction is under the supervision of Donald B. Ward, senior associate civil engineer.

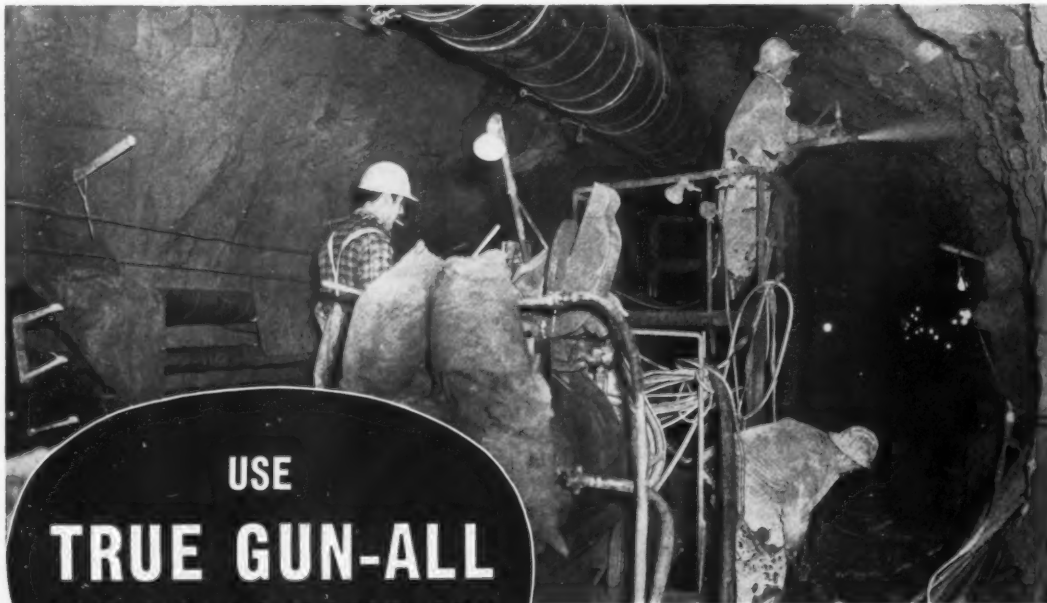
Don Gargaro is project manager for S. A. Healy Co. and Gargaro Co. Joe Czuj was mining superintendent, and Slim Drum, concrete superintendent.

THE END



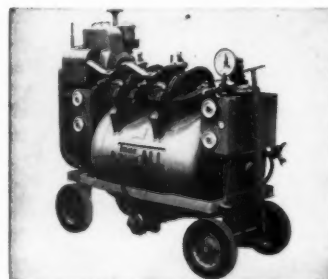
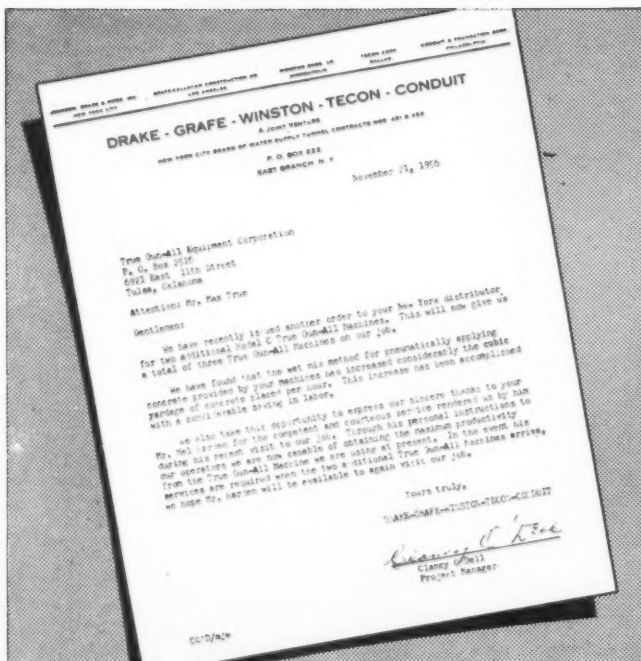
A Cleveland Model 92 trencher digs a section of the 152-mile trench for installation of code cable between Atlanta, Ga., and Greenville, S.C.

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Case history

Trenchers on 152-mile project stand up well

The Southern Railroad recently completed the installation of an underground code cable in a 30-inch-deep trench along 152 miles of track from Atlanta, Ga., to Greenville, S.C., for its centralized traffic-control system. The long, 12-inch-wide trench in which the cables were buried was dug by two Model 92 Cleveland trenchers, and code cable was fed into the trench right behind the trenchers' digging wheels.

The project involved some fairly rugged digging in ground full of rocks, boulders, and cinders, and varying in composition from clay to dirt and mud. During winter months the trenchers worked in slush so deep in places it would reach up to a man's hips.

Boulders and other underground obstructions, which it had been thought would have to be removed by pick and shovel men, were easily picked up by the trenchers. "If the Clevelands couldn't pick up an obstruction we'd call for the rock drill or we'd blast," commented C. A. Woodyard, signal foreman on the operation.

The trenchers also had to work almost constantly on a slant because of the railroad's sloping road bed. This necessitated almost constant brake steering to keep the trenchers digging into the roadbed bank. Despite this and the rugged soil conditions, wear on the two Clevelands was far less than had been expected. Not once during the entire 152-mile project did the Clevelands require overhauling, nor were there any breakdowns. Only minor replacements due to natural wear had to be made.

The job moved forward smartly, as much as 6,300 feet of trench being dug and cable laid in a single day. In good digging, each of the Clevelands would dig 52 feet of 30-inch-deep trench every 5 minutes. Over-all production average for the entire 152-mile line was a quarter mile per day.

For further information on Cleveland trenchers, write to The Cleveland Trencher Co., Dept. C&E, 20100 St. Clair Ave., Cleveland 17, Ohio.

Circle No. 84.

For more data on products, circle the indicated number on the Request Card at page 18.

CONTRACTORS AND ENGINEERS



Practical
of tech

Instead of the shortage of County Roadmen is doing. It has an erating to t on some of engineers. handle just —with the men—will projects. H to the tech the job. For the p Worth, co Martin St tion engin this progr educate p them into With the tors from are given in trigon and inspec The Wa sion has p many oth and for r them. Th of 2½ mi of Detroit often assu state high The co part in o the big e as well a ing the 2 county. O the exten cities at Airport. sponsible developm sewer an work. th a minim and from sists. during t The ed designed men are quire th course, a partmen As an ad the depa pay sca this cate a level v



men

A county education program helps relieve engineer shortage

Practical courses taught by field engineers develop staff of technical men, permitting engineers to handle several jobs

Instead of just complaining about the shortage of engineers, the Wayne County Road Commission of Michigan is doing something about it.

It has an educational program operating to train technical men to take on some of the work of professional engineers. Instead of being able to handle just one project, an engineer—with the aid of qualified technical men—will be able to oversee several projects. He will act as a consultant to the technical men who remain on the job.

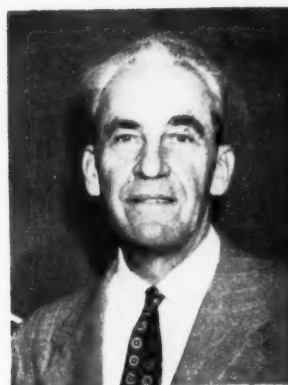
For the past two years, W. J. "Gus" Worth, construction engineer, and Martin Strasen, assistant construction engineer, have been developing this program which they believe will educate promising trainees, turning them into qualified technical men. With the help of engineer-instructors from their own ranks, courses are given during the winter months in trigonometry, surveying, testing, and inspection.

The Wayne County Road Commission has perhaps a greater need than many other agencies for engineers and for men who can help replace them. The county has a population of 2½ million and includes the city of Detroit, and its road commission often assumes the proportions of a state highway department.

The commission plays an active part in designing and constructing the big expressways through Detroit as well as maintaining and expanding the 2,000 miles of roads in the county. One of its current charges is the extension and enlargement of facilities at the Detroit-Wayne Major Airport. The commission is also responsible for the maintenance and development of a large network of sewer and water lines. With all this work, the construction branch has a minimum of eleven survey crews and from 85 to 100 engineering assistants. This number almost doubles during the construction season.

The education program is primarily designed for these men. Sometimes men are hired specifically to acquire the benefits of the training course, and often men within the department volunteer for the courses. As an added incentive to the trainees, the department has set up a special pay scale that allows men rising in this category to acquire salaries on a level with professional engineers.

(Continued on next page)



Martin Strasen, assistant construction engineer, is one of the organizing forces behind the classes which have been developed over the last two years to train technical men who can relieve engineers of the more routine duties.

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Athey PR15-Cat DW15	22-tons, 15.6 cu. yds.
Athey Hydraulic Ejection-Cat DW21 (or DW20)	31-tons, 22.5 cu. yds.
Athey PD20-Cat DW20	30-tons, 22 cu. yds.
Athey PH20-Cat DW20	45-tons, 62 cu. yds.

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On-the-job training is the heart of the six-month equipment operators' course. This trainee on the Athey Hi-Loader is working under the direction of Herman Kuhn, head of the operators' class. Men qualified by the course are in line for any operator openings.

(Continued from preceding page)

Engineers teach courses

In the first year of the program, Worth and Strasen took an active part in the teaching of the courses, but as the program grew, they stepped down to allow field engineers to do the instructing. They found that the engineers, who already had experience in breaking in members of their party in the field, made good practical instructors. The engineer-instructors, aided by their supervisors, decided what material should be taught.

The high attendance at the classes has been evidence of the men's enthusiasm for the program. They enjoy the opportunity to learn and to advance themselves in their work.

From the supervisor's viewpoint, the program is producing better crew members and inspectors and tending to standardize field practices.

Practical courses

Practical trigonometry was the first in a series of courses given under the program last fall. The two-hour class met one evening a week from October to December. Twenty-five men, attending the classes on a voluntary basis and supplying their own texts, studied the basic trigonometric functions and took great interest in the practical application of these functions to the work they had been doing in the field. The application of trigonometry to curves and triangulation was also studied.

Next on the education program was a course in elementary surveying. A total of six sessions of the class were held during the working day. The 43 men who attended received both field and classroom instruction and were required to take a final examination. Classes stressed basic transit and level work as well as the duties of chainman and rodman. Something generally not given in surveying texts, but supplied to men in this course, was a price list of surveying equipment. The instructors felt that if a man realizes a transit costs about \$700, he will handle it with greater care.

Inspection school

The turnout for the inspection school was so great that the group had to be split into two classes of 42 men each. The classes met every other day for a total of five sessions. Each 3-hour session was held during working hours. Using the specification book of Wayne County as a text, the instructors went over the details of the testing and inspection of earth fills, drainage structures, concrete and bituminous pavement, and numerous other items.

An effective teaching aid was a file of colored slides showing faulty construction in the county. When a slide was shown to the class, the instructor pointed out how this construction mistake could have been avoided by good inspection. Seven men, in addition to attending the regular inspection school, were selected to spend two full days at the testing laboratory to become familiar with the inspection of hot-mix plants.

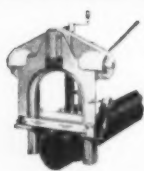
Foreman school

Although an education program for the construction division is a comparatively recent development, the maintenance division, headed by George Burr, has had schools for foreman and equipment operators for many years. The foreman's school is attended by about 20 men chosen from the laborers employed by the department for at least two years.

These 2-hour classes are given once a week, during working hours, for a 12-week period in the winter months. Eldon Smith, the instructor of the foreman's school, teaches the men the fundamentals of arithmetic.

CONTRACTORS AND ENGINEERS

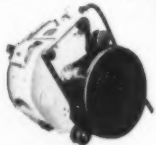
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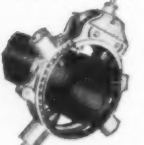
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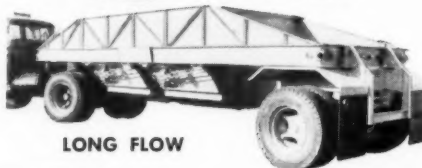
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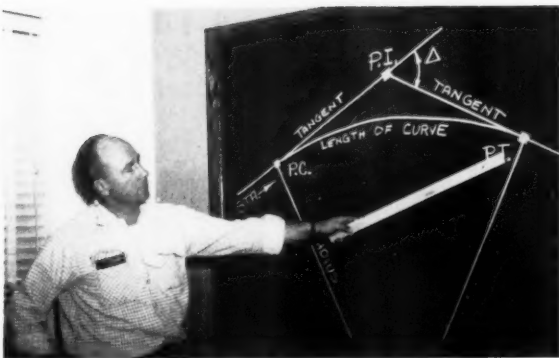
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INEERS

Walter Meyers, one of the engineer-instructors, discusses a problem in the elementary surveying class. Field engineers teach trigonometry, surveying, testing, and inspection courses during the winter months.



stressing such basic problems as the calculation of volumes and areas. Included in the course are sessions on asphalts, safety, and the care of equipment. The men who graduate from this class may go on through two more advanced levels of foremen schools that deal more intensively with the same subjects. The men who complete the course successfully are put on an eligible list, which means that they are next in line when a foreman position opens.

The equipment operator's school, headed by Herman Kuhn, consists primarily of on-the-job training. A carefully selected trainee is allowed to work with an experienced operator on a piece of equipment for a period of six months. If after this time the trainee has not learned how to operate the equipment, he may demonstrate his proficiency with the pick and shovel. But if his work is satisfactory, he will be next in line for any openings.

THE END

Case history

Bin vibrator reduces cement batching costs

Operating on ordinary ac power without a rectifier, an Eriez Model EZ-20 Hi-Vi magnetic unit bin vibrator installed by Agnew-Joseph Co., Ronceverte, W. Va., contractor, is providing continuous, even flow of cement into the batching unit of the contractor's automatic cement plant on a railroad relocation project.

To date, more than 20,000 batches have been dispensed without the slightest adjustment being required by the new unit.

D. G. Agnew of the contracting firm declares: "We were formerly obliged to maintain constant manual hammering of the bin; this has now been eliminated, and our over-all cement batching costs have been reduced."

Instead of the simple hammering action of equipment heretofore available, the Hi-Vi unit combines a powerful permanent magnet with an electro-magnet to set up a unique "double-diaphragming" or kneading action in the bin wall. Positive, continuous supply of material is said to be assured, with positive prevention of sticking, arching, or bridging of material.

For more information on the bin vibrator, write to the Eriez Mfg. Co., Dept. C&E, 420 Commerce Bldg., Erie 6, Pa.

Circle No. 101.

For more facts, circle No. 568→

Marion elects officers

Four officers have been elected by the Marion Power Shovel Co., Marion, Ohio, a division of the Universal Marion Corp. Two new vice presidents are Robert Campello, former general sales manager, and Martin R. Tuttle, former general works manager. William R. LeMasters is now secretary-treasurer, and David Reich was elected assistant to the president.

Re-elected officers are M. T. Smith, president and general manager; A. F. Busick, vice president of engineering; and David E. Rizor, vice president for large machine sales.



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New B&D 3/8" Heavy-Duty HOLGUN is POWER-BUILT for tremendous torque

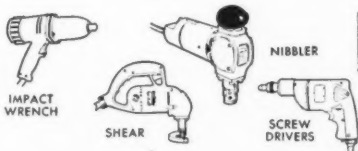
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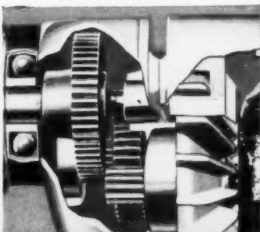
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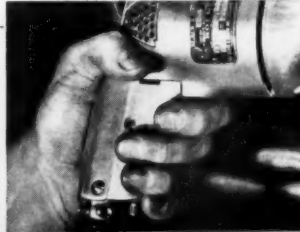
THREE STAGE GEAR REDUCTION and low speed create tremendous torque in this handy drill.



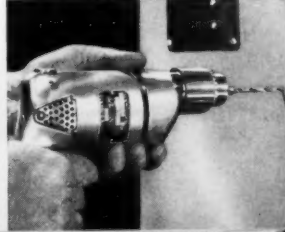
MASONRY DRILLING, demanding a tool that holds speed under load, is clean and fast with this drill.



PISTOL GRIP DESIGN, unique in a drill of this capacity, is perfect for close-quarter work.

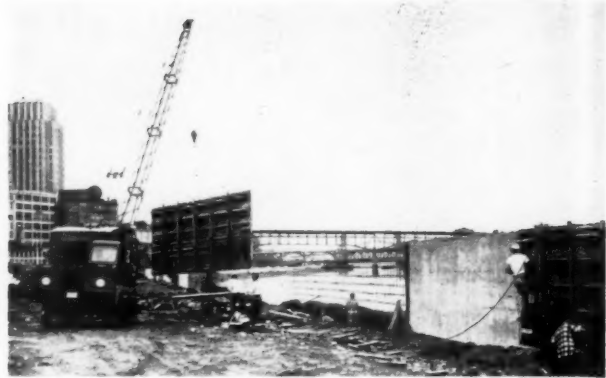


MONEL AND STAINLESS STEEL drilling are good applications for the low speed unit.





Engineering service proves short cut to economy, efficiency



Gang forms of 10x24-foot and 15x24-foot prefab panels speeded the pouring of a retaining wall 2,400 feet long on the Mississippi River in downtown St. Paul.

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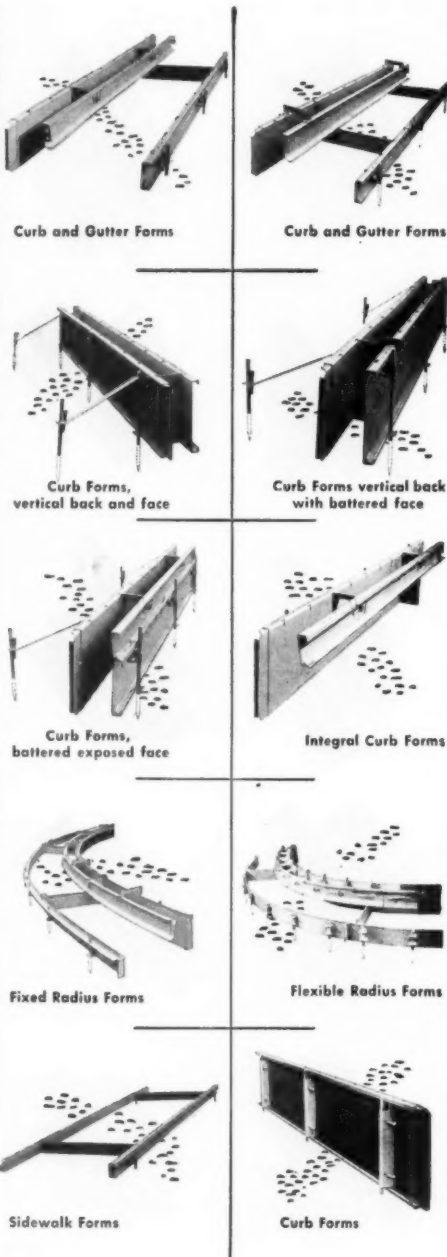
The forms shown at right are but a few of the many types available—for complete information see Bulletin 2259-R. Your nearest dealer has it or you can write direct to Blaw-Knox for it.



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BLAW-KNOX



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John Symons, president of the firm, and Charles Schmidt, head of the engineering department, make no claims for the special genius of their men, nor has the department ever attempted to supplant the engineering departments of contractors. Rather, it has assumed much of the routine work in this phase of construction and made itself available on jobs where Symons' forming experience could be helpful.

Retaining wall

One of the most unusual jobs the department has handled involved work recently with a Denver supplier and the subcontractor, the Long Con-

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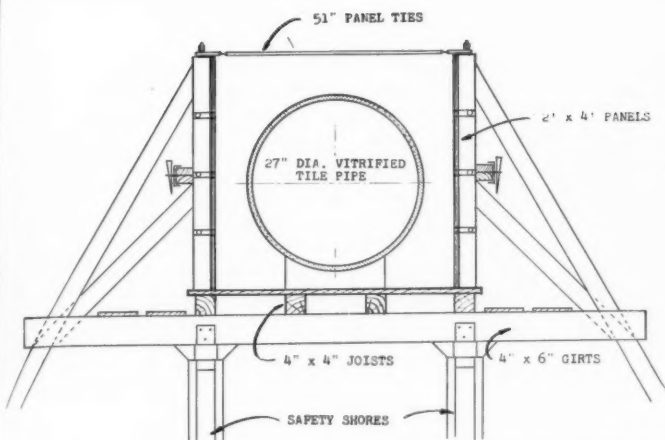
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CONTRACTORS AND ENGINEERS

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A section through the concrete aqueduct at Streator, Ill.

struction Co., Denver, on one of the first phases of the new Air Force Academy at Colorado Springs—construction of a retaining wall. Total forming involved approximates 600,000 square feet.

The walls are battered and have counterforts on 14-foot centers. They vary in height up to a maximum of 32 feet and in widths from 12 inches at the top to 18 inches at the bottom. Customarily, the forms opposite the junction of the 30-inch-thick counterforts and the main wall would be made up of standard 2-foot-wide panels and 6-inch-wide fillers. In this instance it would have involved additional waling, much extra labor, and extra time for handling.

Symons' solution was to manufacture special 30-inch-wide steel frame and plywood-faced forms to eliminate the extra waling, speed erection, and substantially reduce labor costs.

Pouring manholes

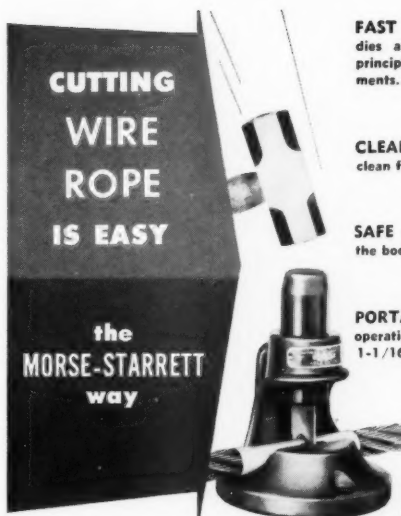
From an Air Force Academy to pouring manholes—this is typical of the range of jobs brought to this engineering service. Pouring manholes can run into a substantial sum for a utility the size of Union Electric Co. of St. Louis. "How can we do the job cheaper?", Symons' St. Louis representative asked engineering.

The answer was an octagonal grouping of panels framed in magnesium with a panel of plastic-coated plywood. In this case the panels have none of the conventional tie slots, but are joined together by the usual method of connecting bolt and wedge. Light and strong, the manhole panel units can be re-used many times.

Sewers can be a problem. Take the case of a sewage job near Streator, Ill. Extending 27-inch pipe 525 feet across a broad ravine to a sewage treatment plant without allowing the line to pitch more than one inch per 100 feet could have been done by building a fill to create a long, gentle slope to support the pipe, but this was too costly.

Achitects Warren & Van Pragg of Decatur, Ill., designed an aqueduct, with supporting concrete piers spaced 25 feet apart, to contain a big vitrified tile pipe. While this solved the cost problem, it didn't eliminate all construction difficulties. Total weight was over one ton per linear foot.

The answer? Large footings meas-
(Concluded on next page)



FAST — Especially designed cutting blade and dies assures fast cutting action. The hammer principle eliminates any special skill requirements.

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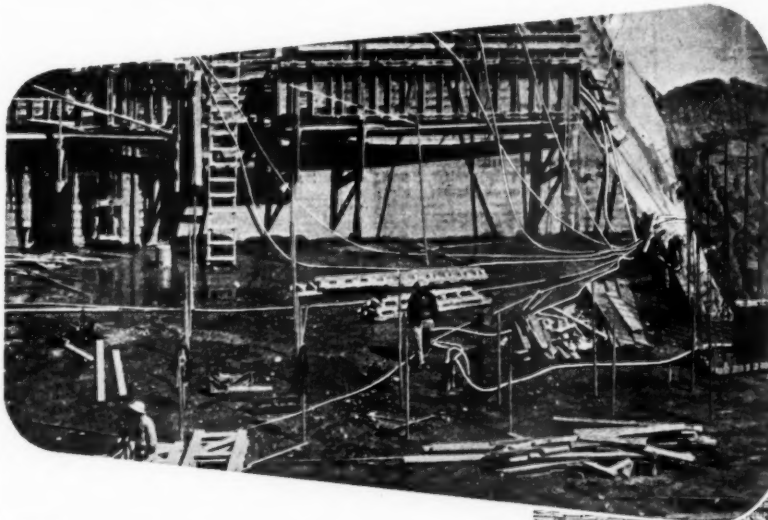
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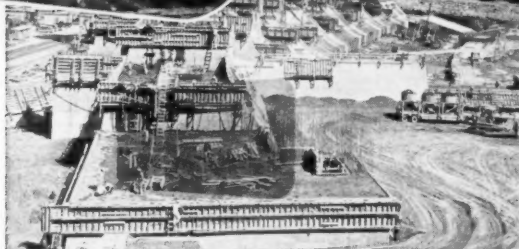
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35B Gates General Purpose Water Hose for long life in rough service. A superior hose for all types of wet-down service... for concrete making... for discharge on small pumps.

This hose is built especially for rough service under all kinds of weather conditions. And it won't chip or scuff off. High or pulsating water pressures are easily handled by Gates 35B. Extra long service life of this hose means money saved. Available in long continuous lengths... 1/2" through 1 1/2" inside diameters.

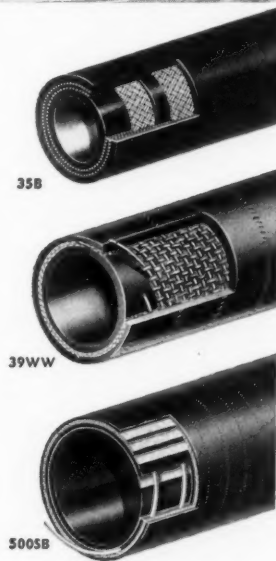
39WW Gates Water Suction Hose withstands extremely rough usage. An all-purpose heavy duty suction hose for use on intake side of any pump requiring hose up to 4" inside diameter. (Can also be used for discharge service.) Tough but flexible. Reinforcing wires and cords are interlaced to provide a strong, well balanced construction.

500SB Gates Heavy Duty Suction Hose with maximum crush resistance. Recommended for use on 4", 5" and 6" centrifugal, diaphragm and piston type pumps, this heavy duty hose has rugged spring steel wire and strong fabric reinforcing to make it practically crush-proof. Tube is compounded to handle abrasive fluids such as those encountered in sewer work. Made with inside diameters from 2" to 6".



The Gates Rubber Company
Denver, Colorado

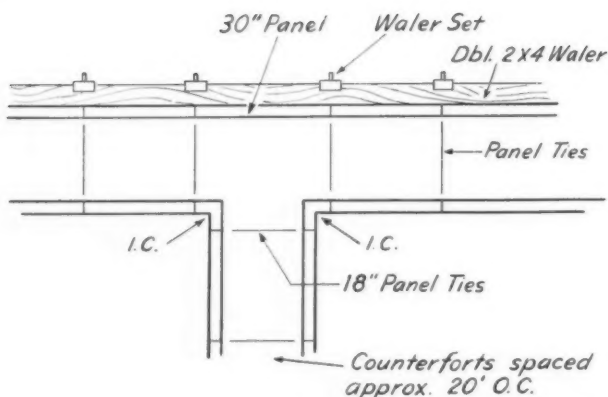
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TPA 165

Gates Construction Hose

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A diagram showing use of 30-inch panel on the Air Force Academy job.



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(Continued from preceding page)

uring 7x7 feet and 1 foot 3 inches thick were built first, since soft ground made it difficult to support the heavy weight of both pipe and concrete. The piers—12x24 inches at the base and 12x48 inches at the top, and from 10 to 19 feet high—were poured in one lift. For the main part of the structure, standard panels with steel cross members and 51-inch ties supported by one set of walers were used on the sides. The bottom was formed with $\frac{3}{4}$ -inch plywood resting on 4x4 joists. Four-inch by six-inch girts could then be placed every 4 feet and supported by shores. The principle of the Roman aqueduct was adapted to a modern sanitation problem.

Gang forming

In St. Paul the problem was speed. A retaining wall 2,400 feet long was required on the north bank of the Mississippi River, prior to construction of Shepard Road, a main traffic artery. The answer was the first use of standard panels in gang forming. Using a total of only 5,400 square feet of forms, the contractor, Hurley Construction Co., St. Paul, was able to pour 140 linear feet a day. Seventy feet of the job was done in one pour and the maximum poured in one week was 700 linear feet.

The job was done with 4x6 and 3x6-foot-wide panel forms made up in gang sections to form a wall battered 18 inches at the bottom and 12 inches at the top. A truck crane was used to remove the forms. For the work Hurley used a cable behind the top waler, and a 2x6 plank was permanently bolted 18 inches from the bottom of the section, making it easy to handle the sections with a crane.

Walers and stiff backs were put on permanently.

On major jobs such as the Air Force Academy, Symons, as a free service, has sent an engineer to the construction site. In New Mexico, for example, a project required use of forms in building concrete linings on mine shafts that, in places, went 1,500 feet below the surface. Another concerned a huge steam plant in Georgia, where concrete alone accounted for more than two million dollars of the project cost. One of the problems involved work on a wall, 35 feet high and tapering from a thickness of 6 feet at the bottom to 30 inches at the top.

In all such cases, where necessary, a staff man is sent to the site to offer any technical assistance he can, or to suggest adaptation of Symons products for the job. Though the average job takes one man three to four days, preparing the plans for a particularly complicated sewage disposal plant took 160 man-hours. That took one man full time for just about a month.

Symons still considers service to be a major function of the engineering department, but it has paid other valuable dividends. Several of the men in the department have graduated to other responsible jobs within the organization. As salesmen they can provide valuable first-hand information for customers. For the company they can also funnel valuable information back to the company for modifying an existing product or creating a new one. From these suggestions from the men in the field and their customers, Symons feels it has achieved even greater progress in the construction equipment business.

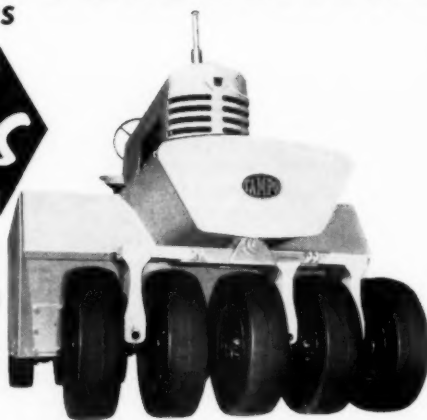
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For more facts, use Request Card at page 18 and circle No. 574

CONTRACTORS AND ENGINEERS



The Hinds Pick-Up Arm, which rotates inside the tilt-up wall slab, spreads the lifting stress over a large area and reduces the stress on any single section of the slab.

Case history

Slab-lifting device saves time, labor

Substantial savings in time and labor through use of a new device for raising precast wall panels are reported by the McNeil Construction Co., Los Angeles.

The Hinds Pick-Up Arm, described as a simple steel bar with holes in the ends, was used in erecting some 40 separate tilt-up panels for Lockheed Aircraft Corp.'s Missile Systems Division plant at Palo Alto, Calif. The bar, encased in a waxed paper container which acts as a form within the form, is threaded onto a short length of 1-inch reinforcing rod tied to the regular reinforcing net. When the panel is ready to be lifted, the upper flap of the carton is torn away and the bar turned out of the carton in an upright position so as to protrude from the slab. The crane shackle is attached at this point. Rotating about the reinforcing rod as the lift is made, the bar acts as a hinge.

The Hinds arm proved more economical than the standard method

in many ways, according to R. S. Knapp, general superintendent for the McNeil firm. The simple shackling operation eliminated the rental of heavy angles, and the time saved in bolting and removing such angles resulted in more panels placed per hour and reduced costs in crane rental. With the Hinds arm, three men were able to attach four pick-up joints in 30 seconds.

Another feature of the lifting device, the company reports, is that cracking and chipping of the tilt-up panel is reduced because stresses against the concrete are eliminated as the slab is lifted into position.

After the wall is erected, the bar is rotated back into the groove and the opening grouted over.

For further information about the Hinds Pick-Up Arm, write to Special Purpose Products, Inc., Dept. C&E, 119 N. Virgil Ave., Los Angeles 4, Calif.

Circle No. 206.

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Built for work up to 100 p.s.i., this hose is tailor made with special heat-resistant rubber tube, plies of quality frictioned duck with heavy rubber separation and tough rubber cover. Sizes: 1/2", 3/4", 1", 1 1/4", 1 1/2", 2". Ask for catalog showing complete line of CONTRACTORS HOSE, HOSE FITTINGS, BOOTS and CLOTHING.

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JUNE, 1957

No Matter What
SIZE...

No Matter What
SHAPE...



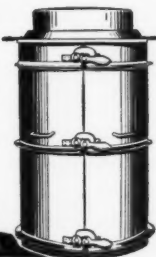
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means longer life to...

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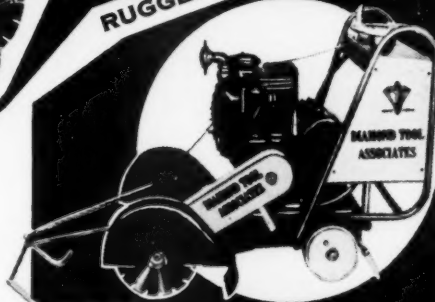


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The best combination for better concrete cutting... DTA* Concrete Cutting Blade and Concrete Cutting Machine! Lightweight, ruggedly built unit capable of heavy duty work as well as trenching, joint cutting and patching.

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-ALL IN ONE
OPERATION

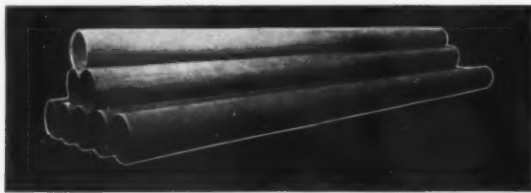


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The Posey Piling above — 40' long, 30" O.D., 1/2" wall — was fabricated for off-shore oil well drilling platforms in the Gulf of Mexico



Posey Piling 52' long, 30" O.D., 1/2" wall, has been driven deep into the bed of the Hudson River to protect the piers of the New York Thruway Tappan Zee Bridge from the pounding of floating ice and debris

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STEEL PLATE DIVISION

LANCASTER, PA.

New York Office : Graybar Building

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Photos show

more than job progress

Pictures protect against litigation, check

subcontractors' work; monthly savings exceed

yearly cost of photographic materials

Progress record photographs are proving more than economical for a Florida engineering and architectural firm. Not only is the system providing up-to-date information for employees and clients, litigation protection, and an accurate check on subcontract work, but it is also a useful tool in showing clients different types of construction techniques and architectural styles, instead of relying on artist's conceptions.

The progress record photographs are also paying off for Reynolds, Smith & Hills, Jacksonville, Fla.—money saved in one month of record shooting, including man-hours, travel expense, and construction time, exceeded the yearly cost of photographic materials.

The idea for an extensive photo-progress system developed out of the day-to-day demands of the job held by James M. Woodruff, director of supervision for RS&H. Written memorandums compiled from notes taken on the job were adequate records of construction progress, but as the contracts multiplied and individual jobs became more complex it became increasingly difficult for Woodruff to

keep management, designers, engineers, and draftsmen in touch with the progress of a job. The ideal solution to the problem was progress photographs that pinpoint important structural details and over-all progress on a job.

System saves money

Recently the photo-progress file proved to be a money-saver on an insurance company construction project. The insurance company management requested an addition to the original building, which had been designed and constructed by RS&H several years ago. No problem—RS&H draftsmen simply made their studies from existing photographs on file and work began on the addition immediately.

Again, when the firm's associates are with an out-of-town architect or engineer on a specific project—as they have done on occasion—the photo-progress file makes it possible for the remotely-located architect or engineer to watch the construction progress, and to make any suggested alterations and changes which he deems necessary.

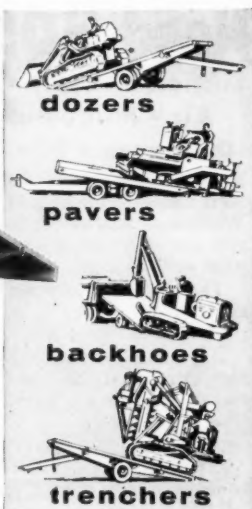
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CONTRACTORS AND ENGINEERS



Progress photos point up errors and omissions by the contractor or subcontractors. Recently, the supervising engineer noted, in this early progress photo, that the required row lock sills in a wall had been omitted. The contractor was alerted in time to correct the job.

Progress photos taken during construction can serve as evidence should litigation arise. Proof of adherence to quoted specifications such as metal floor decking, reinforcing steel, and floor ducts, to name a few, can be established by early progress photographs that present tangible evidence of their existence.

Conversely, progress shots often point up errors and omissions by the contractor or subcontractors. Recently, when specifications called for row lock sills in a wall, early progress shots showed the supervising engineer that the sills had been omitted. When the home office discovered this, the contractor was alerted in time to make the indicated corrections in construction before the job had proceeded past an economical "point of no return".

RS&H has also found that proposed changes by a client are most easily formulated to fit field conditions when recent photographs are at hand for general discussion.

Sales value

The firm puts heavy accent on the "progress" phase of their photo-progress file system, which is practically intangible in early discussions with prospective clients. Rather than submit several artist's conceptions of a proposed plant, the firm's sales engineers get an accurate picture of exactly what the client wants by showing him progress photos illustrating various types of construction and architecture.

Usually the client is able to describe what he expects of the proposed building from a functional
(Concluded on next page)



Often, RS&H's corps of "shooting" engineers use an inexpensive Brownie camera to achieve striking effects. This "before" shot on a remodeling job shows the detailed evidence of extensive termite damage.

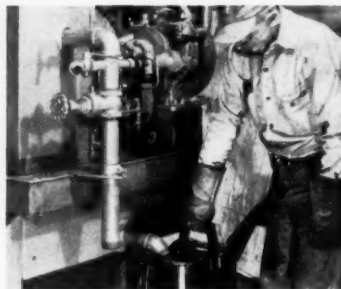
James M. Woodruff, director of supervision for Reynolds, Smith & Hills, focuses his 4x5 press camera on a building under construction.



1. Bar spraying using the standard 10-ft. tubular bar with shifting mechanism. 8-ft. mechanically operated full circulating type also available.



2. Hand spraying without traffic "tie-ups". Bar with two "cold" handles and 25-ft. of hose is fast, efficient, ideal for intersection spraying.



3. Pouring pot patching. Pots filled from gravity discharge line. Allows 101 to be used as a kettle for priming, patching, crack filling and general street maintenance.

LITTLEFORD UTILITY SPRAY TANK

MODEL 101



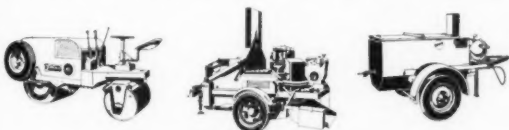
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Who couldn't? It's the Littleford three-in-one 101. For bar spraying, hand spraying and pouring pot patching. It's just like the heavy duty bituminous distributors—but with a shorter bar and smaller pump, naturally.

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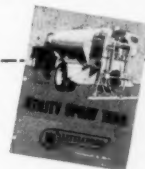


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(Continued from preceding page)

point of view; often, however, he has only the vaguest conception of what he expects of the structure aesthetically.

For example, if a client offers the rather vague comment, "We want a feeling of open-airness", the RS&H representative simply shows the client a picture of a completed building that achieved this aim. The client likes it, the cost is low, and the job is sold on the spot.

Reynolds, Smith & Hills has found that keeping the client sold is as important as the initial selling job. Particularly in school building construction, where unexpected delays in construction may cause drastic changes by the board of education,

progress photos sent regularly to the board members pay off in rich good will dividends.

From James Woodruff and his 4x5 press camera, RS&H's corps of "shooting" engineers has increased to five. An average of 40 photographs, taken monthly, are filed in individual looseleaf binders which contain a complete photographic report for each job. In addition, a label on the reverse side of the picture indicates the job, a brief description of the special feature pictured, and the date the picture was taken.

In effect, what RS&H has established in pursuing its photo-progress file program is remote-control supervision over the vast range of construction jobs in progress. When the occasion demands, immediate on-the-spot reference may be made to any of the several thousand photographs in the firm's master file.

THE END

Asphalt Institute names research engineer, editor

Vytautas P. Puzinauskas has joined the Asphalt Institute, College Park, Md., as a chemical engineer on the research staff. He was formerly a research engineer in the department of civil and sanitary engineering of Massachusetts Institute of Technology, working particularly on soil stabilization with asphalt and resinous materials, and rubber compounding with organophilic clays.

Puzinauskas has authored several articles, including one on the effect of chemical additives in soils stabilization with asphalts published by the Highway Research Board.

The Institute has also appointed Robert J. Lowe a staff editor to handle the editing and production of Institute manuals and other technical publications. Lowe was formerly a technical editor with the Navy Department Bureau of Yards and Docks.

The lighter side

An old small-town building custom was observed in an ultra-modern setting recently when the Connecticut General Life Insurance Co. held open house for building trades workers employed on the construction of the company's new office at Bloomfield, Conn.

Numbering about 1,200, workers and their families turned out for the special preview inspection of the three-story building now nearing completion on a 268-acre rural property site. Nearly two dozen building trades have participated in the work under the general contractor, Turner Construction Co. of New York City. Frazar B. Wilde, Connecticut General president, said the visit was in keeping with an old small-town custom that when a new home is built, the owner invites those who took part in the construction to come in for a "look-around." The largest number of workers on the job at one time was about 900. The building will accommodate more than 2,000 employees.

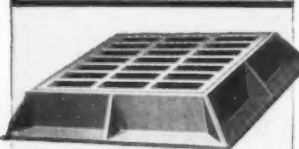
One of the world's largest pre-fabricated buildings for public use, the West London Air Terminal, is now nearing completion in Britain. Located in Kensington at the city end of the new road to London Airport, the \$700,000 building will replace the Waterloo Air Terminal now on the old Festival of Britain site. The structure is scheduled for completion this September, only 4½ months after the

start of construction, and is being erected on a steel and concrete foundation. Numbered component sections have been stored close to the site. The building has a light lattice steel frame; dry construction and self-colored materials are used wherever possible. Exterior walls are of glass and mahogany, and interior walls are faced with a durable colored hardboard. Linoleum tiles, bonded to chip board, are used for the floor, while the ceiling is of fire resisting asbestos board.

An 8-mile vehicular tunnel, the world's longest is now being bored under 15,000-foot-high Mont Blanc on the French-Italian border. It is scheduled for completion in 1960, and will cost about \$28 million. The 24-foot-wide oval tunnel will have two one-way traffic lanes separated by a concrete divisor. Recesses will be provided at 150-foot intervals for cars that develop trouble in the tunnel. Every 1,500 feet a larger recess will be dug into the rock to serve as an emergency repair station. Crews are blasting their way through the granite mountain base from each end at the rate of 36 feet per day. The new tunnel will provide a badly-needed time-saving traffic route through the Alps for tourists traveling between western and southern Europe.

Contractors on Staten Island, one

Neenah FOUNDRY COMPANY construction castings of sound quality...solid value



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Made to fit your requirements—large or small. Complete units, like the Liftomatic, which reaches up to 90 ft., carries 1200 lb. load with electric or gasoline power—or Contractors' Drum Hoist Units, single or double drum, with capacities from 500 to 5500 lb. single line pull. Optional power.



Winches

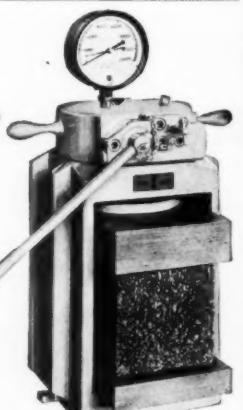
From U. L. approved safety scaffold winches to heavy-duty hand-powered winches that will take from 400 to 40,000 lb. loads, Sasgen has a complete line to handle your job quickly and safely. You can't buy a better winch!



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CONTRACTORS AND ENGINEERS

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of New York City's five boroughs, recently negotiated with a painters' union local. Included in the contract is a clause that each employee must be given his birthday off as a paid holiday, and must be presented with a five-dollar bill by his employer as well. Another union contract, according to the New York State Department of Labor, between a brewery and a Teamsters local, permits unlimited free consumption of the employer's

product at a certain time daily.

• •

The newest of traffic arteries added to this country's road system is the 123-mile Massachusetts Turnpike that opened on May 15th. The east-west toll highway, costing \$239 million, cuts across the Bay State from the circumferential freeway route 128, ten miles west of Boston, to the New York state line.

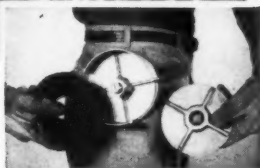
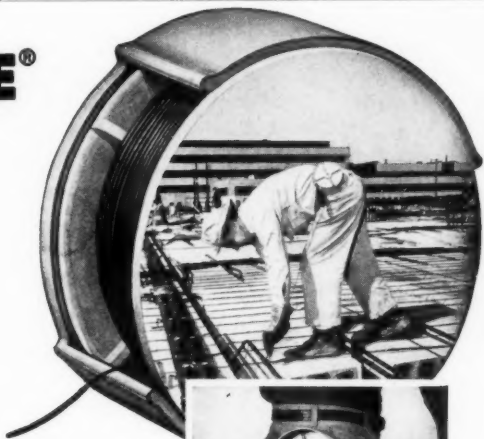
Organization aids research at Virginia university

The Virginia Engineering Foundation, a non-profit corporation, has been established to encourage all types of engineering education and research at the University of Virginia School of Engineering. VEF, operating independently of the university, will set up a general scholarship fund, increase faculty and facilities, and

allow grants for special research by the university's engineering experimental station at Charlottesville, Va.

This research aid will cover projects in electrical, chemical, and mechanical engineering. The university's recent acquisition of a nuclear reactor will also make possible projects in nuclear physics and engineering.

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Contact your nearby CF&I representative today for the complete story on this safe, easy and modern way of tying concrete reinforcement bars.



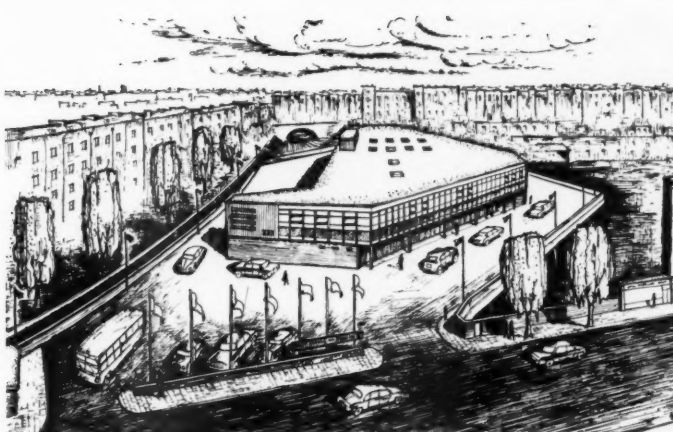
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THE COLORADO FUEL AND IRON CORPORATION

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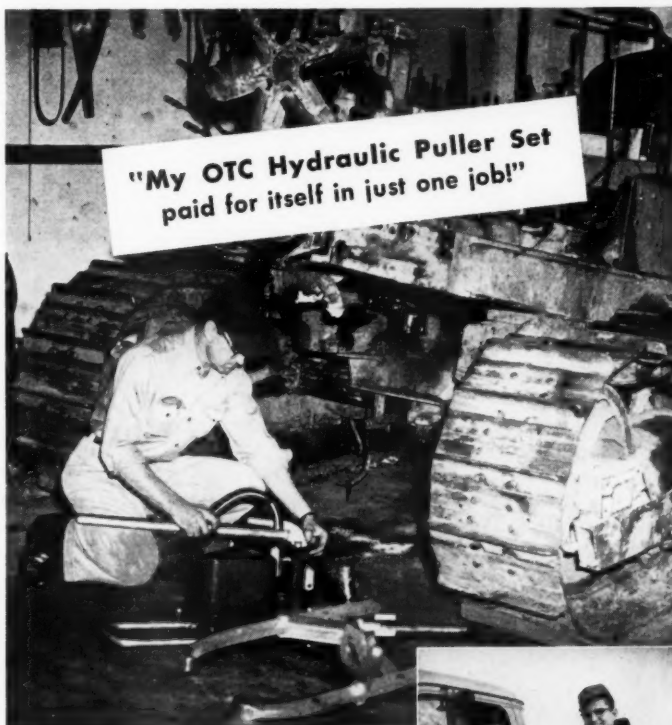
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JUNE, 1957



The new prefabricated building for the West London Air Terminal, as it will look on completion.



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...SAYS CONTRACTOR
LOREN LEAS, LUANA, IOWA



"Running 4 tractors, a scraper and 2 trucks, we can't afford costly time and money losses from breakdowns. Before OTC we often waited from 5 hours to 3 days for service (the nearest repair facility is 100 miles away). Now—with an OTC Power-Twin ram and pump plus attachments—we do virtually all our general and emergency maintenance immediately—in the shop or in the field.

"On one job alone the OTC pulling unit paid for itself."

You too can save money, time, tools, parts — portable OTC Power-Twin Hydraulic pulling system, powered by a 50- or 100-ton ram with hand, electric or gasoline pumps. Add adapters and attachments to fit your equipment—then pull, install sprockets, gears, sheaves, pulleys, bearings, kingpins—on tractors, trucks, heavy machinery.

OTC tools are factory-approved by LeTourneau-Westinghouse, Allis-Chalmers, International Harvester and other leading manufacturers.



Takes only minutes to remove sprocket from Caterpillar D6 with OTC 50-ton ram and accessories. No danger of sprocket breakage.



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Send for new manual—or service bulletin covering your tractor.



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A dump trailer pulled by a loaded Autocar diesel dump truck gets a load of blasted rock for the haul from the quarry to the crusher.



Cost records serve this materials producer

Detailed daily cost records kept by Warner Co. at its quarry operation at Cedar Hollow, Pa., are demonstrating some significant facts about trucking costs. Warner, one of the nation's biggest dealers in concrete, sand, and gravel, records every item of cost that goes into hauling 285 tons of stone per hour each 8-hour day. Horace L. Woodland, plant manager of the quarry, says the records show that:

1. A dump-body Autocar pulling a dump trailer increases the payload capacity of both power plant and driver;
2. the extent of this economy is limited by the capacity of the crusher;
3. diesels cost about half as much—per hour and per ton hauled—as gasoline-powered trucks;
4. maintenance on a diesel may cost more per job but over the years balances out to about the same as that for a gasoline-powered truck.

The Warner Co. did a million-dollar gross business last year. It has furnished construction materials to all kinds of projects, including the Memorial Bridge crossing the Delaware River at Wilmington, the Pennsylvania Turnpike, and the huge Fairless Works of the U. S. Steel Corp.

Haul operation

Warner's Cedar Hollow quarry, just off the Pennsylvania Turnpike in Chester County near Phoenixville, supplies more than 550,000 tons of stone a year to the firm's operation.

In hauling huge pieces of stone blasted from the 85-foot face of the quarry to the crusher, Warner used a fleet of three trucks. Each carried a 17-ton load. Woodland, always experimenting on methods to increase production economically, tried a tandem hook-up using a 17-ton dump trailer drawn by a 17-ton side dump Autocar. This resulted in saving the operating costs of an additional truck and operator.

The daily analysis shows that diesels cost about half as much per hour and per ton hauled in both phases of the operation—hauling stone from quarry to crusher and from crusher to storage.

The haul on the bottom of the big quarry involves a long horseshoe curve route of about 1,200 feet with an over-all grade of about 4 per cent, to the feeder of a large 48x60-inch Traylor jaw crusher. In sloppy weather this becomes quite a grind

TOUGH JOBS CALL FOR JOYCE JACKS ... *Yello-Jackit* models to lift or shift every work load!

Big power for vertical jacking ... full power for horizontal pushing ... versatile power to lighten labor, cut job time, assure dependability and safety. See the whole husky line-up, 3 tons to 100 tons capacity, at your Joyce distributor today, or write to Joyce for distributor nearest to you!



NEW JOYCE YELLO-JACKIT LIFTMASTER HAND HYDRAULIC JACKS

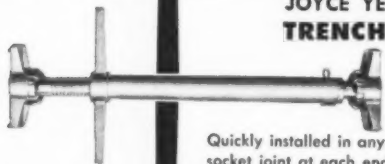
3 to 100 ton capacities

Eight models. Rugged, lightweight screw extension type ram with fractional rise control. High efficiency permits short handle operation in close quarters.



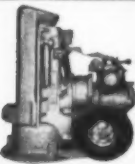
JOYCE YELLO-JACKIT RATCHET JACKS

Rugged, precision-built models of 5 to 20 tons capacity, properly balanced for easy carrying.



JOYCE YELLO-JACKIT TRENCH BRACES

Quickly installed in any width trench ... ball and socket joint at each end adjusts to any angle ... steel screw ... available with or without pipe.



JOYCE YELLO-JACKIT AIR MOTOR JACKS

Capacities of 20, 35, 50, 75 and 100 tons with or without exclusive Joyce Toe Lift. Lightweight for easy portability on their large, semi-pneumatic tires. Rugged, simple Ingersoll Rand air motor.

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Joyce's labor saving
Jack Line

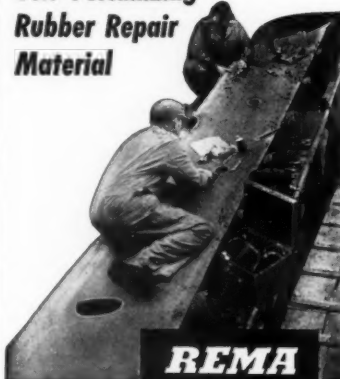


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CONTRACTORS AND ENGINEERS

with a gross weight (tractor and trailer) of from 65,000 to 100,000 pounds.

The second part of the operation is hauling crushed stone from the crusher to the stockpile at the end of an uphill route of about 2,000 feet on a 10-to-12 per cent grade. On this particular job two big 15-ton payload jobs—one a gasoline-driven single-axle Autocar and the other a single-axle Autocar diesel—brought about a sizeable economy by replacing three 10-ton trucks.

The figures of the fleet are bearing out Woodland's theory that diesel and gasoline maintenance costs—although they vary greatly on specific jobs—average out about even in the long run. Major overhauls on diesels are more expensive than on gasoline trucks, but are less frequent. Wood-

land adds that this finding is based on past figures and experience. There has been no major overhaul on his present fleet, which is only two years old. He expects all of these trucks to be run for several more years.

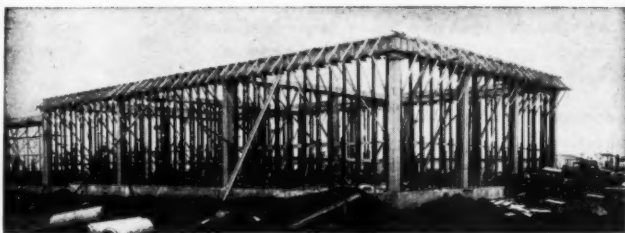
Woodland's daily cost record keeping has convinced him that the big tandem-axle diesel is economical, and that his quarry fleet is made up of long-life tractors. In the coming years—and he still sees several years' service for these trucks—he will replace all the old rigs with Autocar diesels.

Woodland says that as a result of his surveys, he finds his big Autocar trucks are economical on the basis of low maintenance costs and improved performance. He is convinced that the big diesels are up to 50 per cent cheaper to operate. **THE END**



Case history: Giant skids, formed by fastening timber to steel with a Ramset powder-actuated fastening tool, helped make it possible to move this five-story, 4,000-ton jail 300 feet to make way for a new road in Little Rock, Ark. The tool, with a simple pull trigger, seats a hardened steel fastener into as much as an inch of steel. As many as five fasteners were installed per minute. Ramset Fastening System, Olin Mathieson Chemical Corp., Dept. C&E, 460 Park Ave., New York 22, N. Y. Circle No. 91.

Another Outstanding Job Employing ELLIS METHODS of Concrete Construction



NEW C.A.A. AERONAUTICAL CENTER IN THE SOUTHWEST

Flight Operations Building, above, is part of an approximately 1,000,000 square foot project, which includes a 15-acre warehouse. Photo shows Ellis Shores, Clamps, and Shoreheads in use.

The **SPEED, ECONOMY, ADAPTABILITY, and SAFETY** of Ellis Methods play an important part in the construction of these new C.A.A. buildings at Will Rogers Field in Oklahoma City. In this case, the contractor uses 14-foot and 9-foot upper shore members instead of the usual 7-foot length. Standard heads are shown here, and some double heads are being used on other parts of the job. The shores and heads you see here will be re-used later, with no cutting or splicing required. Ellis Shores "go up and down" fast and are adaptable to all situations.

For suggested methods on your next job, at no obligation, mail specifications to:

Ellis

MFG. CO., INC.

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For more facts, use Request Card at page 18 and circle No. 589

To obtain further data on products described in these pages, circle the designated number on the Request Card at page 18.

WADSWORTH RIPPERS CUT COSTS

TO INSURE PROFITS ON JOBS WHERE ROCK AND EARTH MUST BE BROKEN AND MOVED. RIPPERS SAVE WEAR ON DOZERS AND SCRAPERS, CUT LOADING TIME, AND ELIMINATE DRILLING AND BLASTING COSTS.

ROCK RIPPER

rips up to 5 feet deep in toughest rock. Hydraulically controlled. Allows front mounting of dozer or push block. Model available for any crawler tractor.

CONTRACTOR'S RIPPER

rips to 30 inches deep, and 99½ inches wide. Rigidly mounted standards are adjustable in 4 steps of 6 inches each. Easily installed, offset-mounted standards eliminate fouling. Furnished with H & L boots and points.

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You'll like the mobility feature — cross-country, around the yard — and you'll find its 120-125 yds. output per hour a profitable performance under most conditions.

Heart of this crushing plant is the 18 x 36 roller bearing Eagle Jaw Crusher — ready to tackle any crushable material that enters its super-tough manganese steel jaws.

Power for the main 65 H.P. motor and the several other motors that control conveyors and screens is supplied by portable generator or supply line.

Eagle pioneered the electrically welded one-piece frame — stands ready to help you with engineering counsel for your particular needs. Write for information!

Manufacturer of Jaw Crushers, Hammermills, Cage Mills and the Eagle Truck-Mounted Loader



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The engineering department

Carpentry and some specialties



by GEORGE E. DEATHERAGE, P. E.

construction consultant



MAYFIELD, Wash.—Workmen, held by safety ropes, drill away on a cloudy stone cliff high above roiling Cowlitz River to prepare abutment for Tacoma City Light's \$37,000,000 Mayfield Dam being built to bring needed electrical energy to the northwest Washington area.

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See Your Nearby PUNCH-LOK Distributor



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**PUNCH-LOK
Company**

Dept. J, 321 North Justine Street, Chicago 7, Illinois

For more facts, use Request Card at page 18 and circle No. 592

Some kinds of work, considered as special, are usually not done by the general contractor but by subcontractors—specialists in their various fields. And while bids are sought on these types of work, it is important that the estimator be familiar with the work itself so that he can check subbids and determine whether or not they are out of line.

Carpentry, for the estimator, concerns not only items constructed of wood but all items and material worked and installed by carpenters. This may include things built of or requiring asbestos board, fiber boards, acoustic tiles, and similar materials. In general, however, carpentry is divided into two classifications, rough

carpentry and millwork. Rough carpentry is further divided into two subdivisions to take care of items constructed of timber and items built of dimension lumber.

Though the man estimating carpentry need not have worked with carpenter's tools, he should know the trade and details of construction. Two volumes valuable for the estimator's library are "Architectural Graphic Standards" and "Wood Structural Design Data". The former, by Ramsey & Sleeper, is in its fifth edition and is priced at \$18.50 by the publisher, John Wiley & Sons, New York, N. Y. It contains large-scale details of all types of construction in rough carpentry and millwork.

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CLUTCHES

For more facts, use Request Card at page 18 and circle No. 593

CONTRACTORS AND ENGINEERS

This is the eighteenth of a series of articles on Construction Management by George E. Deatherage, P. E., construction consultant. The articles are based on an eight-volume "Manual of Advanced Construction Management" published by Geo. E. Deatherage & Son, P. O. Box 921, Lakewood, Fla. The manual is used in a training course for superintendents and project managers, and is directed primarily at those contractor employees who have reached the foreman level or its equivalent, and who need practical help in order to take complete charge of construction projects themselves.

"Wood Structural Design Data", which can be secured through the National Lumber Manufacturers' Association, Washington, D. C., contains complete data on the physical and mechanical properties of wood, as well as safe loads for dimensioned lumber and timber for the usual spans and conditions.

Quantity analysis

The only safe and dependable method of estimating carpentry is the quantity analysis method. Using this, the estimator will take off and price individually every piece of lumber or millwork required. In floor work, for instance, this means listing joists, bridging, subfloor, deadening felt, and

finish flooring separately, rather than estimating a composite price per square foot of floor area.

Lumber and timber prices vary greatly, depending on the quantity purchased, and whether or not the material is bought from local yards or from the mill or mill brokers, whether or not it is rough or dressed, and whether it is of random width or length. Proper air and kiln drying is a thing of the past, and the estimator should be careful to consult specifications that may limit the moisture content. A considerable amount of lumber is now purchased in truck lots of from 8,000 to 10,000 board-feet, since this is economical when carloads of lumber are not wanted or

when carloads would require extra handling.

It is always economical to buy not only the lumber required for the permanent structure but also that required for temporary use, since a lower price can be secured on the larger quantity.

The various lumber manufacturing associations have established uniform grading rules that are in general use for lumber. Invaluable to the estimator for grading information is "Lumber Grade-Use Guide", published by the National Lumber Manufacturers' Association, Washington, D. C. Valuable also as time-savers for the estimator are catalogs and handbooks containing estimating tables. These show such things as the number of feet of lumber required per

square foot of 2x4 stud partition; the quantity of dressed and matched, or tongue-and-groove boards required per 100 square feet of wall; the linear-foot table of board measure; the quantity of lumber required for laminated wood floors, and the amount of surface that 1,000 feet of flooring will cover.

Heavy mill construction

Heavy mill construction, figured per 1,000 board-feet, has more lumber per foot of length and its costs will be much lower than those quoted for rough framing. Influencing costs will be the manner of framing, the size of the timber, whether or not machinery is needed to hoist and place the wood, and other variables.

The only safe method for estimat-



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A-C Transformer Type
in 16 models from 20 to 800 amperes

A-C Submerged Arc Type
3 models, 150 to 1875 amperes

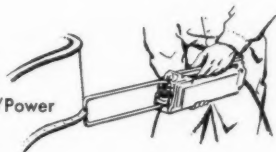
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12 models, 3 to 1500 amperes

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3 models, 300 to 1000 amperes

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Arc Welding
6 models, 10 to 525 amperes

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14 models, 1.5 to 20 KVA

A-C and D-C Engine Driven Welders/Power
Plants
6 models, 15 to 350 amperes



A-C/D-C Combinations for Inert Gas/Metallic
Arc Welding
8 models, 10 to 550 amperes

A-C Inert Gas Welders
23 models, 5 to 700 amperes

High Frequency Units
9 models, up to 1000 ampere capacity

High Frequency Units with Water/Gas Controls
8 models, up to 1000 ampere capacity

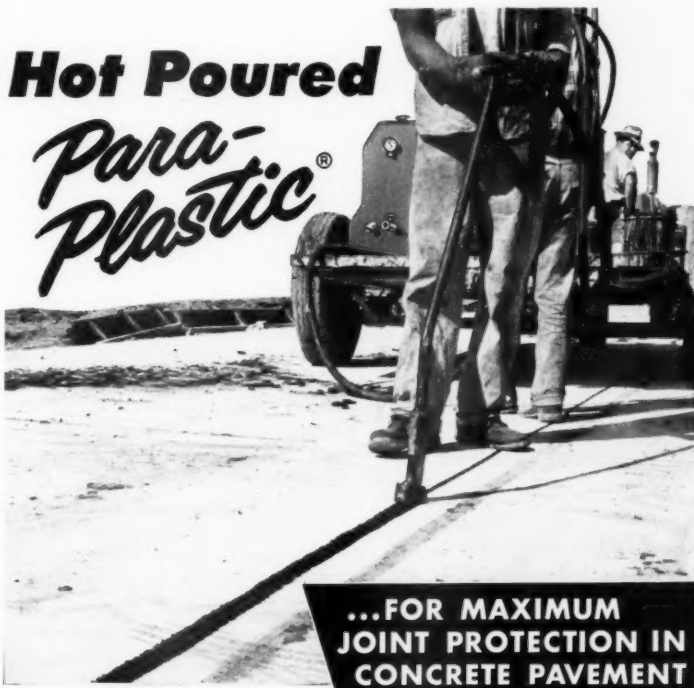
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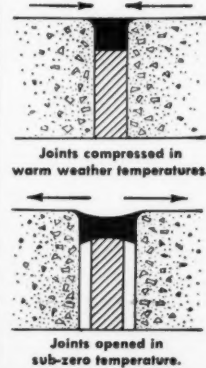
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PERFECT SEAL FOR YEARS

Drawings at right illustrate the unique characteristics of Para-Plastic Joint Sealer during extremes of temperatures. The compound remains plastic at sub-zero temperatures and changes only slightly in hardness and viscosity during higher temperatures. Serviced technicians are available to assist you in waterproofing problems and to make recommendations for installations of a specific nature. Ask for details.



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Bank cleanup on the middle fork of the Stanislaus River at Beardsley Dam, Calif., is handled for Morrison-Knudsen Co., Boise, Idaho, by this Gradall. In the background are the two hills that will provide anchor points for the sides of the dam structure.



Rock and heavy traffic combine to make work on U. S. 25 W between LaFollete and Jellico, Tenn., complicated. In one of the toughest sections, blasted rock and dirt is being loaded out by a shovel to a Euclid 15-ton rear dump. A. B. Long, Harriman, Tenn., has the job.

FOR EFFICIENCY and ECONOMY... 2 WAYS TO MAKE CRANE OPERATIONS PAY MORE



1 RUD-O-MATIC Combination Magnet Reel-Tagline

Rud-o-Matic Combination Magnet Reel-Tagline saves expensive electric cable wear on overhead and boom crane jobs. Tension on the steel tagline cable keeps the strain from the expensive electric magnet cable. Now standard equipment with major crane manufacturers, the Rud-o-Matic Combination Magnet Reel-Tagline is made in five models to fit your present equipment. Insure complete tagline control on your crane with Rud-o-Matic!



2 RUD-O-MATIC Tagline

Crane operations are more profitable when you install Rud-o-Matic Taglines. Heavy duty torsion coil spring keeps tension on tagline cable at all times for bucket control. Buckets are held steady at any angle of the boom. Available in 11 models for various bucket sizes and pull out requirements. Taglines delivered fully equipped with fairlead and cable attached—ready to install. Get more pay loads per day with your crane with Rud-o-Matic Tagline Control!

For full information on Rud-o-Matic Taglines, call or write—

**McCAFFREY-RUDDOCK
TAGLINE CORP.**
2131 E. 25th St. • Los Angeles 58, Calif.
For more facts, circle No. 596

(Continued from preceding page)

ing, as before, is to make an analysis of the cost of fabricating and erecting each item—columns, girders, beams, and others. Estimators should use care in taking off accessories such as bolts, hangers, stirrups, washers, split rings, plate connectors, and splice plates, since these should be listed under miscellaneous iron in the estimate.

The importance of the project manager's, superintendent's and estimator's knowledge of wood and wood product terms cannot be overstressed. Many times they will have to interpret the technical part of specifications in which these terms appear. They will also have to order the material. A knowledge of the terms is also required for checking deliveries and for seeing that the material delivered is in accordance with specifications and their order.

Plastering is only one of the many kinds of work that fall in the "specialty" category. As far as plastering

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PERMANENT but PORTABLE union-built construction buildings of finest kiln-dried, tongued and grooved West Coast lumber. No foundations needed. Sections bolt together quickly for strong, rigid, on-the-job service. Easily dismantled and moved. Buildings come complete with wooden floor, skids, roofing, doors, windows, hardware and prime-coated exterior.

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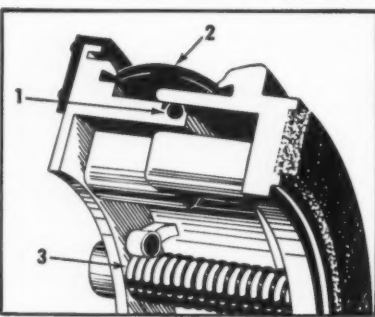
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ECONOMY Construction Buildings are available in many sizes to satisfy any space requirements. Buildings over sidewalk on skids, L to R, 10x12', 10x12' (\$347.30), 10x16', 10x16' (\$453.45), 10x24' (\$665.70). F.O.B. West Chicago, Illinois.



30' WIDE SERIES Ideal for offices, workshops, sheds, storage. Extensible in 10' sections from 20' length to 250' and up. Post-supported roof—no floor, 30' x 100', only \$3665, F.O.B. West Chicago, Illinois. Available also in clear span.

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- Outer Bellows Seal impervious to grease and oil.
- Inner "O" ring seal gives double protection.
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Give Your Tractor Double Protection
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FINAL DRIVE BELLOWS SEAL

Sure-Seals protect your tractor against loss of final drive lubricant by using an inner seal in addition to the regular outer bellows seal. This extra seal is a neoprene "O" ring riding inside two metal flanges which prevents the lubricant from reaching the bellows. Protect your investment, guard against down time—install Sure-Seal Final Drive Bellows Seals with double protection. Made for Caterpillar D-4, D-6, D-7, D-8 and TD-24 tractors.



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Sure-Seal Equipment Co. 1820 N.W. 25th AVE., PORTLAND 10, ORE.

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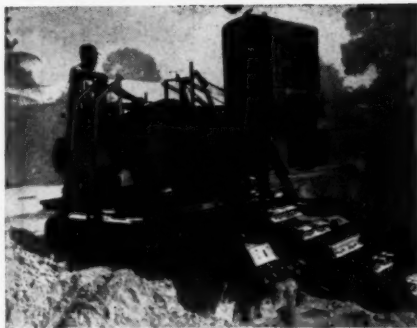


Too big to be carried by rail car or highway truck, a 110-ton hub and shaft assembly arrives by Autocar truck and trailer at Langley Field, Va. The huge assembly for the field's transonic wind tunnel was floated down the Delaware River from Eddystone, Pa., and hauled by Autocar to Langley Field.

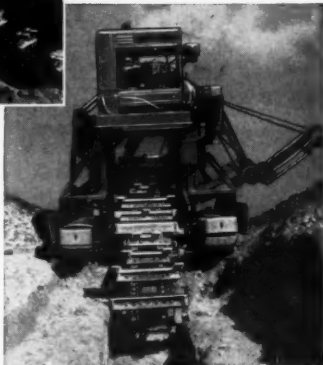


At home on the range is this Cat D8 with Caterpillar root plow. The attachment is being used by T. C. Martin, Edinburg, Texas, to clean cactus and mesquite roots from the right-of-way for alignment of U. S. 281 near Pleasanton, Texas. The plow also breaks up sod and other surface growths before grading starts.

POW-R-DITCHER DIGGING IN THE "TOUGHEST ROCK IN THE WORLD"



Photos show a 524T Pow-R-Ditcher owned by Troup Bros., Inc. digging in solid coral rock, the "toughest rock in the world" according to O. Dittrich, Finn Machinery Co. of Miami, Florida. He says his customer is extremely satisfied with the 524T Pow-R-Ditcher's performance under the toughest of conditions.



BIG DITCHER PERFORMANCE AT LOWEST DIGGING COST

Because of its low original cost and low maintenance cost, the Pow-R-Ditcher does the work of more expensive units at half the cost. Digs 8"-24" wide, one man operation. Very maneuverable. Easy to transport. Write for complete information on the 524T and smaller Pow-R-Ditcher models.

Some Excellent Sales Territory Available

VERMEER MFG. CO. 1437 W. Washington, Pella, Iowa

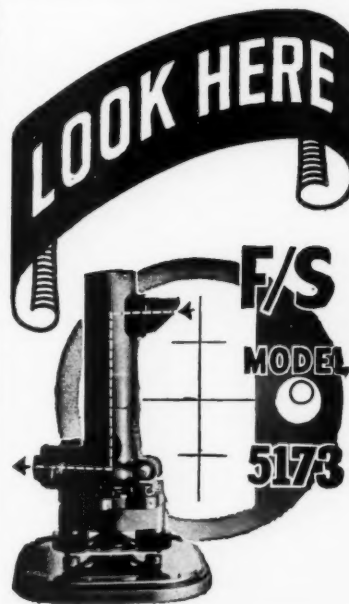
For more facts, use Request Card at page 18 and circle No. 599

is concerned, trade customs vary in different localities as to the items included in the plasterer's job. In some cities, plastering subcontractors' associations have uniform rules and forms for the subcontract that may be consulted by the estimator.

Tabular estimating data on the various types of stucco and plaster materials are presented in manufacturer's catalogs, which will also give the price of the materials by the ton. The usual discounts are made for purchases in quantity.

Right now, wood lath is virtually a thing of the past. The ordinary procedure is to use gypsum board for cheaper work and metal lath for the best work. In some areas, local union rules will permit carpenters to install the material; in others, this is considered lather's work. In figuring quantities needed for a job, allow 2 per cent for waste.

Metal lath serves in many places where there is no practical substitute. This work, also estimated in square (Continued on next page)



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Now you can get a reliable precision instrument, WORKING 3 TIMES FASTER THAN A CONVENTIONAL LEVEL—and with no complicated adjustments . . . no variations caused by changes in temperature!

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FEATURES:

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- Built-in Sunshade
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CANADA: Instruments 1951 Ltd.—Ottawa—Toronto—Regina—Montreal.

Send for further information

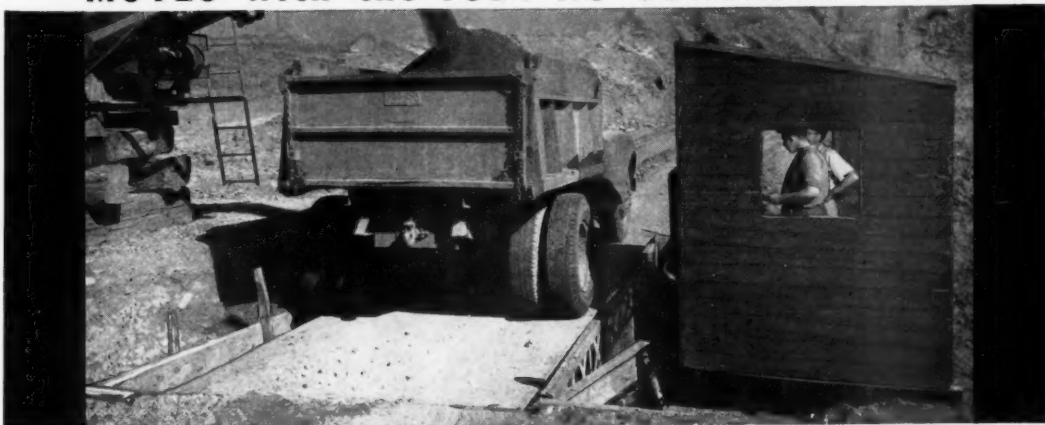


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SALMOIRAGHI INC.**

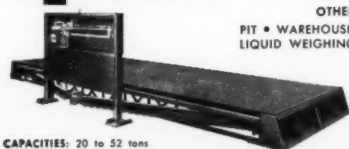
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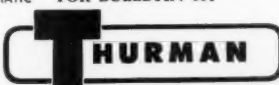


CAPACITIES: 20 to 52 tons
DECK LENGTHS: 18 to 43 ft.

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DEPT. CO, COLUMBUS, OHIO**

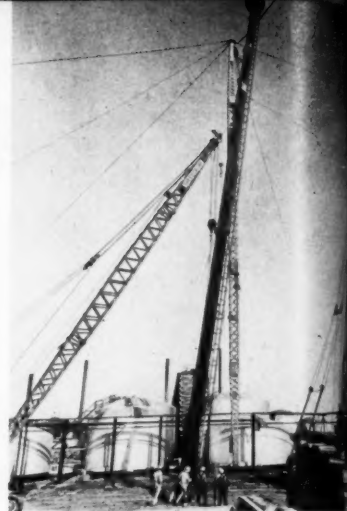
For more facts, use Request Card at page 18 and circle No. 600



Averaging depths of 73 feet, a Koehring 304 crane uses a Vulcan No. 1 steam hammer to drive 16-inch spiralweld pipe for a bridge carrying U. S. 190 across the Brazos River near Hearne, Texas.



Working a quarry supplying concrete aggregates for Table Rock Dam near Branson, Mo., a Joy drill puts down blast holes. The drill and Ingersoll-Rand Gyro-Flo 600 air compressor are mounted on a Euclid truck.



"Walking in" a 225-foot flare stack during work on a refinery, a rigging crew uses a 140-foot gin pole, aided by a Manitowoc Speedcrane, to make the lift.

yards in place, is usually handled by specialized union lathers. There are many types of metal lath—some designed for a particular type of work, such as stucco. Ordinary types are flat expanded, flat rib, $\frac{3}{8}$ -inch rib, sheet metal lath, wire lath, V-stiffened, and wire lath and wire fabric—either plain or paper-backed.

Stucco

Exterior and interior stucco, prepared from a portland cement base, is ordinarily applied in three coats:

scratch coat, brown coat, and finish coat. It can be applied directly to masonry or on stucco mesh on wood framing. Prices will vary according to the quantity of the work, materials, and workmanship. There are numerous finishes that can be used—rough float, rough cast, pebble dash, basket weave, and Spanish finish among others.

Wood base may be either single, two, or three-member construction and grounds for fastening should be (Concluded on next page)



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12 matched units now available
78 Barrel, single axle
Excellent mechanical condition
Priced to sell.

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REDWOOD 1-2323

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PRIME-MOVER M30 FOR ENGINEERED CONSTRUCTION Hauls $\frac{2}{3}$ yard or 1- $\frac{1}{2}$ tons. Unloads transit mixers fast. Spots concrete right where it's needed on plant, warehouse, pier and bridge construction. Hydraulic Torque Converter Drive frees the operator from shifting, clutching and wasted effort. Rugged, dependable. Bucket and flat bed interchangeable.

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FOR HIGH VOLUME, LOW COST PLACING OF CONCRETE AND OTHER BULK MATERIALS—USE PRIME-MOVER POWER!



PRIME-MOVER M15A FOR BUILDING CONSTRUCTION

The established method of placing materials on school, hospital, and commercial building projects. Places 12 to 17 cu. yds. of concrete per hour—without extensive preparation for its use. Runs on same type of ramps, hoists and runways as hand carts. Available with flatbed, or 10 cu. ft. bucket.

FOR COMPLETE DETAILS WRITE TO PRIME-MOVER CO., MUSCATINE, IOWA
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NOW CANTON MAKES WIRE ROPE CLIPS

MAKERS OF A COMPLETE LINE OF

LOAD BINDERS

CANTON "CONTINUOUS-ACTION"

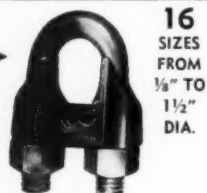
Picks up slack, binds in one operation. Design and heavy-duty construction eliminate spread or release while in use. 360° swivels each end. Full range of sizes.



LEVER, RATCHET, and SPRING-TYPE

A F M "RATCHET-TYPE"

Popular "turnbuckle" principle made in 5 sizes. Full 8" take-up. Excellent tool for use also in truing operations in construction work, road and bridge building, steel erection.



16 SIZES FROM $\frac{1}{8}$ " TO $1\frac{1}{2}$ " DIA.

CANTON MFG. CO. 2400-13th St. N.E., CANTON 5, OHIO

Telephone Glendale 3-3614
For more facts, use Request Card at page 18 and circle No. 602

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CONTRACTORS AND ENGINEERS



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Compaction of the 4½-inch hot-mix wearing course, bonded to the reinforced-concrete roadway of the \$100 million Lincoln Tunnel Third Tube, is started by a Buffalo-Springfield roller. The 8,000-foot two-lane roadway was paved under a separate contract just before the May 25 opening.

Part of some 800,000 yards of granite rock and earth—the result of a 1,000-foot wide landslide—is moved from California Highway 89 at the head of Emerald Bay on Lake Tahoe by an Allis-Chalmers HD-21 tractor-dozers. The difficult-to-maintain stretch is being cleared by H. Earl Parker, Marysville, Calif.

(Continued from preceding page)

taken off and listed under rough carpentry in the estimate. All base is estimated per linear foot installed. The cost will be smaller if rooms are large, affording straight long runs and having few corners or mitres. A carpenter should place from 100 to 150 linear feet of wood base daily. The wood base itself is usually made in stock patterns and the details of each may be secured from local mill-work supply houses.

Roofing and sheet metal

Like plastering, roofing and sheet metal work for both industrial and commercial buildings is generally subcontracted. But as in the case of plastering, the estimator should know how to get a price on roofing and sheet metal work quickly so that he can check subbids.

Roofing of all types is usually estimated by the square of 100 square feet in area, whether the roof is built up of felts or consists of some type of shingle. Sheet metal work is estimated in various ways—by the square foot, linear foot, or the weight of the metal—depending on its nature and area.

The general contractor relies to a large extent on subbids whenever roofing has to be done with wood shingles, asphalt shingles, prepared roll roofing, or slate. Slate, particularly, is a specialty that requires experienced mechanics and efficient supervision. The estimator should put his dependence on subcontract bids when slate roofs are specified.

It is obvious that the old tried and true procedure of breaking the work down into its many component parts, then pricing them individually, is the only safe method to use in estimating roofing and sheet metal work. An over-all price per square foot of roof cannot be stated unless the detailed specification is known and all the incidental items are taken off and priced.

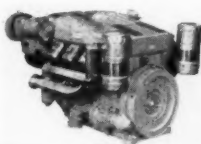
(Next month's article will deal with "The Engineering Department—field work change orders".)

A complete section devoted to new products appears on page 121.

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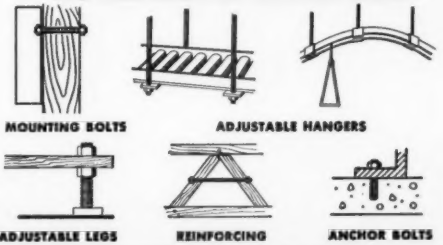
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INDEX TO ADVERTISERS

(Names in italics are advertising agencies)

Acme Iron Works 184
Thomas F. Conroy, Inc.
Air Compressors, Inc. 134
Air Placement Equipment Co. 198
Carter Adv. Agency, Inc.
Allis-Chalmers, Constr. Machy. Div. . 67, 69, 71, 73
Bert S. Gittins Adv., Inc.
American Hoist & Derrick Co. 102, 103
Ruthrauff & Ryan, Inc.
American Steel & Wire Div. 28, 29
Batten, Barton, Durstine & Osborn, Inc.
Anthony Co. 38
Biddle Co.
Arps Corp. 134
Ervin R. Abramson Adv., Inc.
Athey Products Corp. 193
Thomson Adv., Inc.
Austin-Western Works ... 214
Gray & Rogers
Autocar Div., White Motor Co. 135
Gray & Rogers
Badger Machine Co. 146
Graves & Associates
Baldwin-Lima-Hamilton Corp., Construction Equip. Div. 94, 106
Gray & Rogers
Barber-Greene Co. 40
Buchen Company
Bay State Abrasive Prod. Co. 106
Berg-Marshall, Inc.
Benton Harbor Engrg. Works, Inc. 176
Mayer, Klann, Linabury Adv., Inc.
Bethlehem Steel Co. 140
Jones & Brakeley, Inc.
Bettis Corp. 181
Archer & Woodbury
Bil-Jax, Inc. 119
Chamberlin-Junk Adv., Inc.
Black & Decker Mfg. Co. 128, 195
VanSant, Dugdale & Co., Inc.
Blaw-Knox Co., Const. Equip. Div. 196
Russell T. Gray, Inc.

Browning Mfg. Co. 111
Ruth C. Askew, Advertising
Brunner & Lay, Inc. 163
Norman P. Hewitt, Advertising
Brush Aboe, Inc. 211
Buck Equipment Corp. ... 191
Perry-Brown, Inc.
Bucyrus-Erie Co. 154
Bert S. Gittins Adv., Inc.
Buffalo-Springfield Roller Co. 143
Curtiss, Quinlan, Keene & Peck, Inc.
Burch Corp. 153, 200
Morgan Adv. Co.
Burmeister Co., L. 159
Western Adv. Agency
Calweld, Inc. 173
Dan Ebberts Adv. Service
Canton Mfg. Co. 210
Rex Farrall, Inc.
Caterpillar Tractor Co. . 7, 14, 20, 21, 33, 97
N. W. Ayer & Son, Inc.
Champion Mfg. Co. 58
Advertising Associates, Inc.
Chevrolet Div., GMC 75
G. M. Basford Co.
Chicago Pneumatic Tool Co. 179
Childers Mfg. Co.
Childers Mfg. Co. 155
Pierson & Drury Adv. Agency
Clark Equipment Co., Const. Machy. Div. . 76, 77, 216
Marsteller, Rickard, Gebhardt & Reed, Inc.
Cleveland Trencher Co. ... 151
Meermans, Inc.
Clinton Machine Co., Engine Div. 13
Biddle Company
Clipper Mfg. Co. 72
Kaufman Adv. Co., Inc.
Coffing Hoist Div., Duff-Norton Co. 186
Bond & Starr, Inc.
Colorado Fuel & Iron Corp. 93, 203
Doyle, Kitchen & McCormick, Inc.
Columbus McKinnon Chain Corp. 194
Comstock & Co.
Concut Sales, Inc. 181
Frank Barrett Cole, Advertising

Construction Machinery Co. 96
Weston-Barnett, Inc.
Continental Motors Corp. 172
Hopkins Agency
Continental Rubber Works 199
Eugene C. Laird, Advertising
Contractors Pump Bureau 105
Maurice Mullan, Inc.
Creative Metals Corp. 66
E. W. Shafer & Co.
Cutler Engineering Co. 137
Advertising Art and Copy
Deere & Co. 59
Critchfield & Co.
Diamond Chain Co., Inc. ... 81
Kirkgasser-Drew
Diamond Tool Associates . 199
Lionel & Simons, Inc.
Dodge Corp., F. W. 91
G. M. Basford Co.
Dorsey Trailers 136
Morris Timbes, Inc.
Douglas Fir Plywood Association 78, 79
Condon Co.
Drott Mfg. Corp. 46, 47
Aubrey, Finlay, Marley & Hodgson, Inc.
Dudgeon, Inc., Richard ... 187
Richmond Adv. Service, Inc.
Duff-Norton Co. 82
Bond & Starr, Inc.
Eagle Crusher Co., Inc. ... 205
Coleman Todd & Associates
Eagle Iron Works 175
Tri-State Adv. Co., Inc.
Earth Equipment Corp. ... 19
The McCarty Co.
Economy Buildings, Inc. ... 208
Kenneth B. Butler & Associates
Economy Forms Corp. 168
J. M. Hickerson, Inc.
Eimco Corp. 10
Matsie Co.
Ellis Mfg. Co., Inc. 205
Galloway-Wallace Adv. Agency, Inc.
Euclid Div., GMC . 36, 37, 41
Richard T. Brandt, Inc.
Eveready Brikshaw Co. 39
Felker Mfg. Co. 150
Clyde D. Graham, Advertising

Filotecnica Salmoiraghi, Inc. 209
Frank G. Comstock, Advertising
Flexible Road Joint Machine Co. 56, 57
Duffy, McClure & Wilder, Inc.
Flexible Steel Lacing Co. ... 204
Kreicker & Meloan, Inc.
Food Machinery & Chemical Corp. 84
McCarty Co.
Ford Div., Ford Motor Co. . 165
J. Walter Thompson Co.
Foundation Equipment Corp. 63
Frederick Iron & Steel, Inc. 190
Emery Adv. Corp.
Fruehauf Trailer Co. ... 42, 43
Allman Co., Inc.
Fuller Mfg. Co. 167
Curtiss, Quinlan, Keene & Peck, Inc.
Fulton Bag & Cotton Mills 85
Fitzgerald Adv. Agency
Galion Allsteel Body Co. ... 158
Palm & Patterson, Inc.
Galion Iron Works & Mfg. Co. 147
Morgan Adv. Co.
Gar Wood Industries, Inc. 86, 87
Meldrum & Fewsmith, Inc.
Gates Rubber Co. 197
Harold Walter Clark, Inc.
G M C Truck & Coach Div. . 88, 89
Kudner Agency, Inc.
Goodrich Company, B. F. 52, 53
Griswold-Eshleman Co.
Good Roads Machinery Corp. 176
G. M. Basford Co.
Goodyear Tire & Rubber Co. 11
Kudner Agency, Inc.
Grace Mfg. Co., W. E. 134
Gradall Div., Warner & Swasey Co. 2
Griswold-Eshleman Co.
Greenville Steel Car Co. ... 125
Meek & Thomas, Inc.
Griffin Wellpoint Corp. ... 213
Monitor Adv. Agency
Guth Co. 158
McCormick-Armstrong Co.
H & L Tooth Co. 27
Orange County Printing Co.
Hansen Welding Co., Hans . 146
Ervin R. Abramson Adv., Inc.
Hardin Associates, Inc., E. L. 177
Kincaid-Chandlee Adv. Agency, Inc.
Harnischfeger Corp. . 148, 149
Fuller & Smith & Ross, Inc.
Heltzel Steel Form & Iron Co. 114, 115
Duffy, McClure & Wilder, Inc.
Hendrix Mfg. Co., Inc. ... 110
Svalos Adv. Service
Hercules Steel Prod. Co. ... 139
Palm & Patterson, Inc.
Hobart Brothers Co. 172
Ralph Dalton & Associates
Hoffman Bros. Drilling Co. 118
Hewitt, Advertising
Homelite Div., Textron, Inc. 60, 61
Sutherland-Abbott
Hough Co., Frank G. ... 48, 49
Ervin R. Abramson Adv., Inc.
Huber-Warco Co. 112
Jay H. Maish Co.
Hyatt Bearings Div., GMC . 30
D. P. Brother & Co.
Hyster Co. 68
Cole & Weber, Inc.
Ideal Reel Co. 141
Ingersoll-Rand Co. 95
Marsteller, Rickard, Gebhardt & Reed, Inc.
International Harvester Co. . 44, 45, 46, 47, 170, 171
Aubrey, Finlay, Marley & Hodgson, Inc.
International Vibration Co. . 100
Howson, Advertising
Iowa Mfg. Co. 116
Russell T. Gray, Inc.
Jackson Vibrators, Inc. 183
Stevens, Inc.

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 Ervin
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 Perry-B
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 H. Arth
 Madsen
 Frank
 Marlow
 Gosse
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 Marvel
 Guenthe
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 Thomp
 Master
 Yeck &
 McCabe
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 Calvin
 McCaff
 Corp.
 Martin
 McCon
 Grubb
 McGow
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 McKier
 Michel
 McKinn
 McKiss
 Martha
 Meadow
 Connor
 Mechan
 Div.
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 Memph
 Brick
 Mercu
 mati
 Frank
 Mid-W
 Inc.
 Associ
 Miller
 M &
 Miller
 Paulso
 Mobile
 LaGra
 Mobile
 Jacobs
 Momar
 Monro
 Co.,
 L. H.
 Morse
 Peter
 Muller
 Thom
 Murray
 Roy E
 Nafisc
 Reula
 Neenal
 M &
 Oliver
 Buche
 Olsen
 Tini
 Renne
 Omaha
 Allen
 Overm
 Reith
 Owato
 E. T.
 JUNE,

Jaeger Machine Co. 54, 55, 65, 181
Maurice Mulloy, Inc.

Jay Co. 184, 185
Pixley Adv., Inc.

Joy Mfg. Co. 156
W. S. Walker Adv., Inc.

Joyce-Cridland Co. 204
Weber, Geiger & Kalat, Inc.

Kensington Steel Co. 180
Alfred Colle Co.

Koehring Co. 144, 145
Andrews Agency, Inc.

LeTourneau-Westinghouse Co. 129, 130, 131, 133
Andrews Agency, Inc.

Lincoln Electric Co. 152
Griswold-Eshleman Co.

Lippmann Engineering Works, Inc. 101
Ervin R. Abramson Adv., Inc.

Littleford Bros., Inc. 201
Perry-Brown, Inc.

Mack Trucks, Inc. 99
Doyle, Kitchen & McCormick, Inc.

Madesco Tackle Block Co. 132
H. Arthur Engleman, Advertising

Madsen Works 15
Frank Barrett Cole, Advertising

Marlow Pumps, Div. of Bell & Gossett Co. 120
Richard La Fond Adv., Inc.

Marvel Engineering Co. 61
Guenther-Bradford & Co.

Martin Machine Co. 189
Thompson Adv., Inc.

Master Vibrator Co. 104
Yeck & Yeck

McCabe-Powers Auto Body Co. 118
Calvin & Co.

McCaffrey-Ruddock Tagline Corp. 208
Martin R. Klitten Co., Inc.

McConaughay, K. E. 138
Grubb & Petersen

McGowan Pumps, Div. Leyman Mfg. Corp. 167, 174
Henthorn Adv. Service

McKiernan-Terry Corp. 70
Michel-Cather, Inc.

McKinney Drilling Co. 85

McKissick Products Corp. 50
Martha Stone & Associates

Meadows, Inc., W. R. 119
Connor Associates, Inc.

Mechanics Universal Joint Div. 187
Midwest Adv. Agency

Memphis Equipment Co. 164
Brick Muller & Associates

Mercury Clutch Div., Automatic Steel Prod. 180
Frank B. Johnston, Advertising

Mid-Western Industries, Inc. 117
Associated Adv. Agency, Inc.

Miller Electric Mfg. Co., Inc. 207
M & M Advertising, Inc.

Miller Tilt-Top Trailer Co. 200
Paulson-Gerlach & Associates, Inc.

Mobile Drilling, Inc. 212
LaGrange & Garrison, Inc.

Mobile Office, Inc. 182
Jacobson & Tonne

Momar Industries 213

Monroe Calculating Machine Co., Inc. 127
L. H. Hartman Co., Inc.

Morse-Starrett Products Co. 197
Peter Hurst Adv., Inc.

Muller Machinery Co. 164
Thoma & Gill

Murray & Tregurtha, Inc. 182
Roy Elliott Co.

Nafisco, Inc. 12
Reuland Adv. Agency

Neenah Foundry Co. 202
M & M Adv., Inc.

Oliver Corp. 32
Buchen Co.

Olsen Testing Machine Co., Tinius 202
Renner Advertisers

Omaha Standard 194
Allen & Reynolds

Overman Mfg. Co., I. J. 123
Reith Studios

Owatonna Tool Co. 203
E. T. Holmgren, Inc.

Pfahler Mfg. Co. 165
Coleman Todd & Associates

Possey Iron Works, Inc. 200
Howard York, Advertising

Prewitt & Sons, J. R. 173
Carl Lawson Adv. Co.

Prime-Mover Co. 210
Clem T. Hanson Co.

Punch-Lok Co. 206
Merrill, McEnroe & Associates, Inc.

Quad City Equip. Co. 104
Boudinot, Advertising

"Quick-Way" Truck Shovel Co. 35
Galen E. Broyles Co., Inc.

Quinn Wire & Iron Works 199
Lessing Adv. Co., Inc.

Radio Corporation of America 64
Al Paul Lefton Co., Inc.

Redi-Bolt, Inc. 211
Fensholt Adv. Agency, Inc.

Remington Arms Co., Inc. 107
Batten, Barton, Durstine & Osborn, Inc.

Reo Motors, Inc. 22, 23
Zimmer, Keller & Calvert, Inc.

Richmond Screw Anchor Co., Inc. 126
Geer, DuBois & Co., Inc.

Rocform Corp. 122
Stockwell & Marcuse

Rockford Clutch Div. 206
Midwest Adv. Agency

Rolcor Industries 128
Olmssted & Foley

Rolatape, Inc. 162
Caron Advertising

Roper Mfg. Co. 96
Brad Wright Smith Adv., Inc.

Rosco Mfg. Co. 123
Foulke Agency, Inc.

Ross Gear & Tool Co., Inc. 175
Caldwell, Larkin & Sidener-Van Riper, Inc.

Sasgen Derrick Co. 202
Symonds, MacKenzie & Co., Inc.

Schlueter Mfg. Co. 211
Winius-Brandon Co.

Schrader's Son, A. 178
G. M. Basford Co.

Servicised Products Corp. 207
Ross Llewellyn, Inc.

Shell Oil Co. 24, 25
J. Walter Thompson Co.

Silent Hoist & Crane Co. 180
Lee-Stockman, Inc.

Simplicity System Co. 17
Power & Condon

Sinclair Refining Co. 34
Morey, Humm & Warwick, Inc.

Snow-Nabstedt Gear Corp. 116
F. W. Prella Co.

Sonoco Products Co. 191
Bennett Advertising, Inc.

Southwest Welding & Mfg. Co. 18
S. K. Olympus & Staff

Standard Oil Co. 113
D'Arcy Advertising Co.

Standard Steel Corp. 19
McCarty Co.

Standard Steel Works, Inc. 84
James R. Reese Adv. Co.

Superior Concrete Accessories, Inc. 124
Admakers

Superior Equip. Div. 85
Western Adv. Agency

Superior-Lidgerwood-Mundy Corp. 168
Albert Frank-Guenther Law, Inc.

Sure-Seal Equip. Co. 208
William Winter, Advertising

Swenson Spreader & Mfg. Co. 179
E. R. Hollingsworth & Associates

Symons Clamp & Mfg. Co. 155
Marsteller, Rickard, Gebhardt & Reed, Inc.

Tampo Mfg. Co. 198
Fraser Advertising

Tarrant Mfg. Co. 163

Templeton, Kenly & Co. 189
Stoetzel & Associates, Inc.

Texas Co., Asphalt 5
G. M. Basford Co.

Texas Co., Lubricants 8, 9

Thew Shovel Co. 51
Thomson Adv., Inc.

Thurman Scale Co. 209
Cye Landy Adv. Agency, Inc.

Timken-Detroit Brake Div. 142
MacFarland, Aveyard & Co.

Timken Roller Bearing Co. 74
Batten, Barton, Durstine & Osborn, Inc.

Trailmobile, Inc. 160, 161
Farson, Huff & Northlich, Inc.

True Gun-All Equipment Corp. 192

Tubular Structures Corp. of America 164
Clarence L. Jay Indus. Adv.

Twin Disc Clutch Co. 141
Curtiss, Quinlan, Keene & Peck, Inc.

Union Metal Mfg. Co. 157
Griswold-Eshleman Co.

Unit Crane & Shovel Corp. 70
Paulson-Gerlach & Associates, Inc.

United States Rubber Co. 90, 98
Fletcher D. Richards, Inc.

United States Safety Service Co. 182
Phillips-Reick-Fardon Adv.

United Steel Fabricators, Inc. 162
Downing Industrial Adv., Inc.

Universal Atlas Cement Co. 169
Batten, Barton, Durstine & Osborn, Inc.

U. S. Steel Subsidiaries 28, 29, 169

Universal Form Clamp Co. 132
Ross Llewellyn, Inc.

Universal Motor Co. 182
Buchen Co.

Van Brush Mfg. Co., Inc. 157
Kalikow Adv. Co.

Vermeer Mfg. Co., 209
Lessing Adv. Co., Inc.

Viber Co. 153
Dan Ebberts Adv. Service

Vibro-Plus Products, Inc. 92
Dobbins, Woodward & Co.

Vulcan Iron Works, Inc. 163
Kreicker & Meloan, Inc.

Vulcan Tool Mfg. Co. 185
S. Gunnar Myrbeck & Co.

Wachs Co., E. H. 194
George W. Hughes Co.

Wadsworth Mfg. Co. 205

Wagner Electric Corp. 83
Arthur R. Mogge, Inc.

Warren-Knight 142
Walter S. Chittick Co.

Waukesha Motor Co. 152
Cramer-Krasselt Co.

WF Steel Products, Inc. 196
Frederick-Clinton Co., Inc.

Wheeling Corrugating Co. 174
Cunningham & Walsh, Inc.

White Instrument Co., David 107
Calkins & Holden, Inc.

White Mfg. Co. 153
Juhl Adv. Agency

Whiteman Mfg. Co. 16
Taggart & Young, Inc.

Wiley & Sons, Inc., John 194
Norman D. Waters & Co.

Winpower Mfg. Co. 186
Grant, Schwenck & Baker, Inc.

Winslow Scale Co. 151

Wisconsin Motor Corp. 105
Paulson-Gerlach & Associates, Inc.

Wisconsin Trailer Co. 191
Ramsthal Adv. Agency

Wix Corp. 31
Humbert & Jones, Inc.

Work Bulls Div., Massey-Harris-Ferguson, Inc. 108, 109
Klaw-Van Pietersom-Dunlap, Inc.

Wrought Washer Mfg. Co. 122
Paulson-Gerlach & Associates, Inc.

Yale & Towne Mfg. Co., Contractors Machy. Div. 215
Dobbins, Woodward & Co.

Yaun Mfg. Co. 190
Herbert S. Benjamin Associates, Inc.

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For more facts, circle No. 609

It's been a sorry year in Washington for advocates of federal construction of a gigantic multipurpose dam at Hells Canyon on the Snake River bordering Idaho and Oregon.

In quick succession the Supreme Court refused to review a lower court decision upholding licenses granted the Idaho Power Co. to build three small dams in lieu of the federal project, and the government granted the private utility fast tax write-offs on two of its dams.

In addition, the Federal Power

Commission, which licensed the Idaho dams in August 1955, authorized Idaho Power to issue \$40 million in short-term promissory notes to aid financing of the projects.

At the halfway point in the congressional term, it appeared almost certain that the lawmakers would draw the final curtain on this extended controversy of public versus private power by rejecting a bill authorizing construction of the 722-foot-high federal dam, which would wash out Idaho Power's program. Pushed

primarily by Western states Democrats, the bill was admittedly the last hope of the high-dam men.

There was no indication that Senate support of the Hells Canyon bill had grown sufficiently to overcome last year's 51 to 41 vote against it, despite last fall's election victories of those favoring public development of the West. In fact, chances seemed to have faded. The big reason, of course, is that construction of Idaho Power's \$67 million Brownlee dam is well under way and scheduled for completion

next year, while preliminary work is beginning on the second dam, located at Oxbow.

Congress is aware of the progress being made on the private dams and even some staunch advocates of the federal structure privately concede that it is this year or never for their plan. They recognize that it would be absurd to try and cancel Idaho's licenses next year when one of its dams will be an accomplished fact.

Under the FPC licenses issued to Idaho, construction of the third dam, at Little Hells Canyon, is not mandatory. But the private utility indicates it will be built after the other two are finished.

Hells Canyon is a sharp party issue. The Truman administration backed the federal high dam idea, but government policy reversed when the Eisenhower cabinet took over.

The Supreme Court issued no written opinion with its decision to leave intact a lower court ruling supporting the licensing of the private dams. In a dissenting opinion, however, Justice William O. Douglas said he felt the court should have listened to the arguments before making a decision. The case had been appealed by the National Hells Canyon Association, National Rural Electric Cooperative Association, and several public utility districts. The states of Washington and Oregon also supported the appeal brief as friends of the court.

While their expressions of regret at this court defeat were relatively restrained, the exponents of a single government dam at Hells Canyon set up shrill protests when the Office of Defense Mobilization subsequently announced that Idaho Power would be permitted to depreciate for federal tax purposes 65 per cent of the cost of Brownlee and 60 per cent of Oxbow in five years. Sen. Wayne Morse (D.—Oreg.), chief sponsor of the Hells Canyon bill, called the action a "shocking betrayal" of the public interest. Other Democrats in the high-dam clique—including Sen. Richard Neuberger and Rep. Al Ullman of Oregon, and Rep. Gracie Pfof of Idaho—charged that it represented a "hand-out" or government "subsidy" of the utility.

Criticism also came from Sen. Harry Byrd (D.—Va.), but for reasons of tax policy. As chairman of the Senate Finance Committee, he said he was against the grant of fast write-off certificates in peace-time, except in rare cases, inasmuch as the program was an emergency measures to push the building of facilities essential to national defense.

It was pointed out elsewhere, however, that Idaho Power had applied for accelerated amortization for the two dams in 1953, before ODM eliminated tax aid to stimulate hydroelectric expansion.

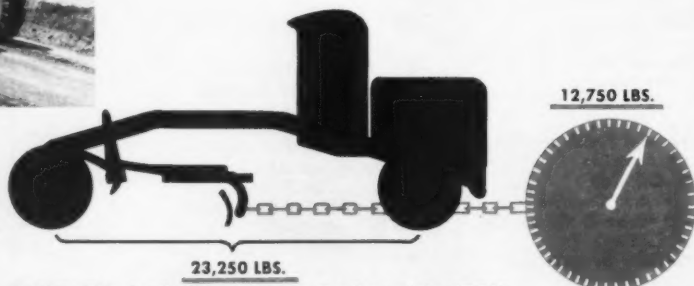
Not "How Big?" But "How Good?"



The ability of any motor grader to do hard cutting, and move big blade loads of material in the lower gears, where heavy work is done, depends entirely upon the amount of weight carried on *driving wheels*. Total weight has nothing to do with it.

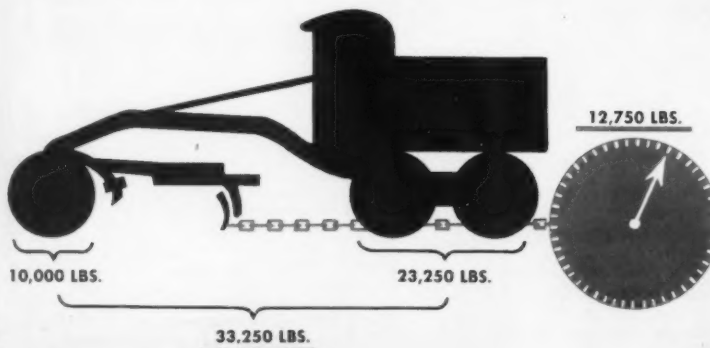
Most for Your Money
From every standpoint . . . first cost, operating cost and upkeep . . . the A-W Power Grader gives you more for your money . . . moves 30 percent more material than an ordinary grader of equal weight and horsepower; and as much material as heavier, more expensive graders . . . as explained in the diagrams at the right.

SIZE IS NOT THE MEASURE OF MOTOR GRADER PERFORMANCE



ABOVE: This Austin-Western Power Grader weighs 23,250 lbs.—all carried on driving wheels. Working in average dirt, it has a blade pull of 12,750 lbs.

BELOW: To obtain the same blade pull, an ordinary motor grader would have to carry 23,250 lbs. on its rear drivers; PLUS about 10,000 lbs. on its dead front end, for a total of 33,250 lbs.



There's more to the story. All-Wheel Steer makes the machine twice as maneuverable as graders with front steer only; while the Controlled Traction made possible by the teamwork of All-Wheel Drive and All-Wheel Steer moves more material . . . moves it farther . . . moves it faster. Your nearby Austin-Western distributor will be glad to tell you the whole story of "The Power Graders That Have Everything."



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For more facts, use Request Card at page 18 and circle No. 610

IT'S A NEW **TROJAN**

**THE NEW
MODEL 154
2 CU. YDS.**



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REVERSE CURVE SAFETY ARMS

Trojan's unique arm design guarantees the operator both absolute personal safety and full 360° vision at all times . . . Curved arms are always below level of the operator — no guard plates, no scissors action . . . No other loader offers this safety feature!

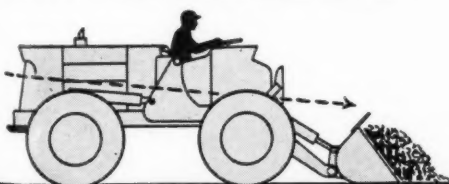
ALLISON TORQMATIC TRANSMISSION

Allows fast, easy shifting at full power with foot clutch eliminated — *forward or reverse* . . . Operator can "feel" load — work at fastest possible speed without fatigue or shock load damage to machine.

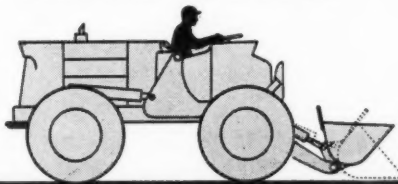
Here's the model 154 — the newest, biggest, most powerful machine in the TROJAN line — with all the operating features for faster, safer, more economical performance on the toughest job! . . . Standard equipment on a TROJAN includes many of the usual extras and you'll find more real dollar value in the '154' than in any comparable machine on the market. Make a date with your TROJAN distributor for a demonstration — any place and any time!

... and all the famous TROJAN operating 'Firsts'!

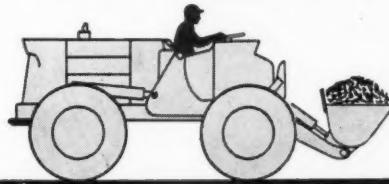
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JUNE, 1957

For more facts, use Request Card at page 18 and circle No. 611

215



"At least one dozer in five should be on rubber!"

says Villa Contracting Company, Westfield, N. J., owners of this Michigan

When Villa Contracting Company decided to update their rubber-tire dozer fleet recently, their choice was the 165 hp Michigan Tractor Dozer.

"We very much liked Michigan's simple, dependable hydraulic control system," explains Partner George Villa . . . "its trouble-free oil-sealed clutches . . . and the fine service record of our Michigan Tractor Shovels. Tests on the job showed us the Michigan Dozer would do as much work as *any* rubber-tire dozer . . . and its price was about \$6,500 less than other big units. *So we bought it!*"

Saves \$150 per move

Michigan is really fast on the job, according to Milford Redman, Villa's General Superintendent. "Spreading fill, for example, it does the job 20% to 50% faster than big track-type dozers," he says. "Between jobs, the Michigan is a lot faster, too. To move crawlers we have to call for a trailer—and it can take half a day to get one from the shop. We figure *each* move costs up to \$150—and on a widening job we might have to move dozers *five times a week*. Our Michigan can travel the couple of miles

required in ten minutes *under its own power*. Its cost, including operator's wages: about two bucks."

"A Michigan pays off on every job"—owner

"We feel it pays to have at least one such rubber-tire dozer *on every job*," says George Villa. "My guess is, the average road-building contractor should have one for every four or five crawler-type dozers. Of course, if your work is in sand you can easily use *more* rubber-tire machines—in city or sewer work, a *lot more*."

"Works faster and better"—operator

"I like the way all controls are at my fingertips," reports Operator Al Therrien, veteran of six years on graders, dozers, pans, etc. "Our Model 180 carries the grade easily. The blade floats in neutral position, and it's easy to back-blade and clean up as I go along." Traveling between assignments, Al reports he stays right up with traffic. "And the Michigan is under perfect control all ways," he says. "Power steering and power brakes make driving it a cinch!"

Let their experience be your guide

Villa Contracting Company asks for a demonstration from their local distributor, Equipment Distributors, Inc. They saw what the Michigan Tractor Dozer could do . . . and, they *bought* it. obvious savings in time and money. *Why don't you do the same?* Your local Distributor will be glad to arrange a test. *you* pick the job. And ask him about the wide variety of purchase plans available . . . including Clark's no-money-down, pay-as-you-profit lease-purchase plan. With it, you can put one or more Michigans to work without laying out a penny of capital!

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